Proceedings of the

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on Research and Development in Science, Engineering and Technology

Organized by

St. Anne's
College of Engineering
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NCRDSET '19

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28th February, 2019

Organised by

St. Anne's College of Engineering and Technology

Anguchettypalayam, Panruti–607106.

Preface

St. Anne's College of Engineering and Technology feels proud in its consistent progress to organize the **Fifth National Conference on Research and Development in Science, Engineering and Technology (NCRDSET '19)** on 28th February, 2019.

In the recent days Technology has witnessed the enormous development in many fields. To import the development and the Technological advancements in the fields of Science, Engineering and Technology, this conference provides a platform to track the quality Research and Development updates from researchers, engineers, scientists, industrialist, academicians and students. It also provides them to express their talents and innovative ideas that will contribute to all fields of Engineering and Science in the upcoming years.

This conference is jointly organized by the Departments of Mechanical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering and Science & Humanities in association with Indian Society for Technical Education (ISTE) and its aims to exchange and stimulate research in the various areas of Science, Engineering and Technology.

It is believed that the research papers included in these proceedings will create a solid background for useful discussions during the conference and for further research. It is also hoped that these proceedings will provide valuable reference material and a source of information on academic achievements and current debate in Engineering and Technology education.

After peer review, the editorial board selected 110 papers from the 189 papers submitted. The selected papers covered a wide range of topics: Advance Trends in Engineering Design, Recent Methods in Manufacturing, AI and Deep Learning, IoT and Networking, VLSI Design/ Embedded Systems, Recent Trends in Communication, Smart Grid and Microgrid Systems, Special Electrical Machines, Smart Materials and Crystalline Materials and Recent Advancements in Applied Mathematics.

All the presentations were much impressive with high level of professionalism, and in many cases original ideas and activities have been accomplished or proposed. The organizing committee would like to congratulate all the authors for their interests and efforts. Also, thank all the participants for their support in making the conference a great success.

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MESSAGE FROM CHIEF GUEST

I am happy to note that St. Anne's College of Engineering and Technology, Panruti, is organizing the **5th National Conference on Research and Development in Science, Engineering and Technology** on 28th February, 2019. There is a pressing need for strong and sustained efforts in development and application of Science and Technology for socio-economic development. It is necessary to mobilize the scientists, engineers and technologists to evolve new strategies and device new technologies to ensure that these technologies reach the end-users. It is also pertinent to note that any research or development will serve its purpose only if it demonstrates a tangible improvement in the quality of life of the society at large. There is also a necessity to expose students to recent advances and trends in science, engineering and technology as they play an important role in disseminating the advances in Science and Technology.

In this context, this conference is a welcome effort in the right direction. I wish the conference all success.

Dr. S. Manickam
Professor
Department Of Manufacturing Engineering
Annamalai University

MESSAGE FROM CHIEF GUEST

<div align="right">**24th February, 2019**</div>

In a world increasingly propelled by technology, Institutional research is the foundation of any nation's economic growth. This is because Science and Engineering research conducted in academic institutions plays a critical role in raising our standard of living, creating jobs, improving health, and providing for national security. Interestingly, India is among the top most countries in the world in the field of scientific research.

This premier institute, St. Anne's College of Engineering and Technology has put forth concerted efforts to align in focus with the national goal of achieving technological self-reliance through conducting this **5th National Conference on Research and Development in Science, Engineering and Technology** in the thrust areas of Engineering like Computer science, Electrical, Electronics and Communication, Mechanical along with Engineering Sciences.

It's a great privilege and profound honor bestowed on me to share my thoughts through my keynote address and through this message column with the maverick and creative minds of this reputed Institute committed to scholastic excellence.

At the outset, I wish to express my heartiest congratulations to the organizers of this wonderful conference. I also genuinely look forward for the active involvement of the conference Participants and make the best out of this wonderful opportunity.
My best wishes to all.

<div align="right">

Dr. K. Jayanthi
Professor
Dept. of ECE
Pondicherry Engineering College

</div>

MESSAGE FROM SECRETARY'S DESK

In this globalised and technological scenario, knowledge as power, quality education, super fast communication systems, and higher level jobs have been some of the concepts which direct the world. In this context, St. Anne's College of Engineering and Technology, a distinguished centre for modern learning, aims at character formation, excellence in teaching, learning, research and placement, empowerment of rural youth, and has grown in all directions with its **Motto: To Build a Holistic Society**. The commitment and continuous hard work of our Faculty instill originality and creativity in teaching, learning and research and one such fruit of their effort   results in conducting a **National Conference on Research and Development in Science, Engineering and Technology (NCRDSET)** every year. I deem it a great joy to congratulate the Principal, organizers, committee members and all the Faculty and Non-teaching staff for their involvement and cooperation to conduct this 5th NCRDSET.

This National Conference, NCRDSET '19, provides ample opportunity to the Faculty, Industrialists and Students to exhibit their research articles, share and exchange their views and aspirations and learn novel methods and approach in their respective field.

 I congratulate all the eminent Faculty and erudite Scholars as well as the young Engineering Students from various Institutions who contributed for the Proceedings of the 5th NCRDSET which comprises the articles with novel themes like Cloud, Soft and Green Computing, IoT and Networking, Smart Grid, Microgrid and Renewal Energy Systems, Emerging trends in Power System, Power Electronics Controllers, Energy Storage System, Advanced Trends in Engineering Design and Manufacturing, Computational Field Dynamics, Designing Tool and Cutting Materials, Composite Materials, Alternative Fuels, VLSI Design / Embedded Systems, Audio / Medical Signal Processing, Advanced Antennas, Green / Lifi Communication, Environment Science, Crystalline Materials, Nano Materials and Nano Structures, Material Science and Chemistry, Mathematical Analysis, Advancement, and Applied Mathematics and English Language Teaching Methodology.

I wish and pray for the fruitful deliberation of this Conference. May the Lord Almighty inspire and enrich every participant to acquire more wisdom, insight and knowledge through this Conference!

Rev. Dr. Sr. Yesu Thangam
Secretary
St. Anne's College of Engineering and Technology

MESSAGE FROM VICE-PRINCIPAL

Dear Participants,

  On behalf of the organizing committee, I take great pleasure to welcome you all for the 5th National Conference on Research and Development in Science, Engineering and Technology (NCRDSET '19).

  Conference is the platform that gives access to academicians, researchers, industry professionals, and students to come together to discuss and interact on an issue or a topic from different perspectives. In this regard, the purpose of this conference is to bring together the fresh and innovative developments in Engineering and Science, and to explore academic research results. The conference received more than 189 papers from 5 tracks. The higher number of submissions has provided an excellent opportunity for a high-quality program, and also calls for a greater demanding and laborious evaluation process. I am indeed thankful to the national experts who have agreed and come forward to enrich the conference with their valuable suggestions. At the outset of this Conference, I extend a heartfelt gratitude to the Editors of the Scopus and UGC approved Journals for their magnanimity hearts to make known the society the contributions of this conference.

  I welcome wholeheartedly all the participants working in different areas of Science and Technology and request to make this event a grand success.

Rev. Sr. S. Anita
Vice Principal
St. Anne's College of Engineering and Technology

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Design of Low Cost CNC Plotter Machine using Arduino Uno

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Abstract - To reduce the cost of the CNC machine we have proposed an idea to recycle the unused Cd-Rom parts from the old computer system. The implementation of our idea consists of the followings: Arduino controller, Stepper motors – for the motion of X and Y axis, mini step Servo motor, CNC shield V3.0, Arduino Processing software, Inkscape software is used to create G-codes for the input data, and arduino processing software using GRBL is used to control the axis x, y and Z axis. Plotting of coordinates is cultured within G-codes prepared by a software after which it is transferred to the microcontroller by which the motor mechanism is instructed to draw the image or text data, motor mechanism includes X-and Y-axes that can each work independently, yet simultaneously

Index Terms— Computer Numerical Control (CNC), G-code, Micro-controller Unit (MCU), Plotter, arduino board

I. INTRODUCTION

A Plotter is a special type of printer that uses a pen to draw images on solid surfaces. In Computer Numeric Control (CNC), microprocessor is used which is capable of processing logical instructions interfaced with a computer. The logical instructions are provided by using a computer in the form of code or text or image which is then transformed into a machine language by microprocessor to be executed by the machine. A CNC plotter machine is a 3D controlled 2D plotting machines which uses a pen to draw text or image on any given solid surface. It can be used for the purposes such as PCB Design, logo design, etc. This project is based on CNC plotter machine with the increasing demand for the use of CNC plotters in universities and laboratories, a cheap and less complex design is an absolute need. The parts used for the plotter in our project are easily available at a very low price and spare part are also used. The construction is very simple and robust.

II. OBJECTIVES

The objectives of this project is to design and implement a CNC plotter machine (Drawing surface area 20cm x 20cm) which will be able to draw a PCB layout (or any image) on a solid surface.

III. METHODOLOGY

A CNC plotter is able to draw complex line drawings. The coordinates are uploaded to the machine controller by a separate program. The image file is transformed into a G-code via Software. Then the code is transferred to the microcontroller by which the motor mechanism is instructed to draw the image. In this project, we are going to present a simple design for a CNC plotter. Our idea is an arduino based design using ATMEGA 328P microcontroller. The machine will have three motors to implement the X, Y, and Z axis. A servo motor will be used along the Z axis for positioning the pen which will go up for logic 0 and down for logic 1[1]. Drawing will be done on the X-Y plane where the positioning will be controlled by stepper motors. Mini CNC Plotter Machine is worked on input as a G codes of Design and Converting it via use of arduino, Stepper Drivers, CNC Shield, Stepper Motor in to a Rotation of Lead screw. We have work on to maintain lowest cost of our project. We have design a simple construction of our project. This is easier way to use stepper motor with lead screw, CNC shield, Stepper drivers, Arduino based atmega328 Board, etc. The Setup of machine is flexible that's why it will be easily Transported and Maintenance time is short.

IV. SOFTWARE AND CODING

A. To Complete The Task Of Entire Project Three Software Is Used
1. Inkscape

To make G-code files that are compatible with this CNC machine user has to use the Inkscape. Inkscape is professional quality vector graphics software which runs on Windows, Mac OS X and Linux. It is used by design professionals and hobbyists worldwide, for creating a wide variety of graphics such as illustrations, icons, logos, diagrams, maps and web graphics. Inkscape uses the W3C open standard SVG (Scalable Vector Graphics) as its native format, and is free and open-source software. To create G-code of an image, the file must have a transparent background. The image should be dragged into the selected area then select "trace bitmap" from drop down window to create a transparent image. Scans are selected as 8 and "Edge detection" is selected to create black & white image. After adding this transparent image in the predefined area, user need to select "object to path" command to create the G-code file of the selected image.

2. Processing

Processing is open source programming language software which is used for electronic drawings. GTCRL processing program is used to send G-code file from user interface to CNC plotter. The port of Arduino UNO is selected after running GCTRL program followed by uploading the desired G-code. Immediately CNC machine will start sketching selected G-code file, sketching can be stopper by pressing 'X' button and both the axis can be moved to their home locations i.e. coordinates '0' by pressing 'H' button.

3. G-code

To draw a text file or design a circuit layout by the CNC plotter firstly the files need to be converted into G-Code. G-Code is a set of instruction that contains number of X, Y, Z, coordinates depending on the file. G-Code instructs X axis of the machine to travel from X1 to X2 points with a specific speed and same is true for Y axis, but for Z axis the coordinates are fixed because only vertically up & down movements are involved.

V. HARDWARE IMPLEMENTATION

1. Arduino Uno R3

Arduino Uno is microcontroller based on ATmega328P Atmel AVR family microcontroller (MCU). It is an open source software and hardware design and manufacture a single of microcontroller. It has 14 digital Input/output pins and 6 Analogue input can be sampled using on-chip ADC. By using open source can be programming Arduino Uno. It also has 6 PWM outputs multiplexed on to the digital IO pins. The dimensions of Arduino Uno measured are [68.6 mm x 53.4 mm]. Figure 4 below shows the Arduino Uno R3 circuit.

Fig 1. Arduino Uno board

2. CNC V3 Shield with A4988 stepper Driver Module and Heatsink for Arduino

The Arduino CNC Shield makes it easy to get your CNC projects up and running in a few hours. It uses opensource computer code on Arduino to control 4 stepper motors using 4 pieces of A4988 Stepper Motor driver breakout board, with this CNC shield and Arduino Uno, can be build project including CNC routers. The purpose of this CNC shield to control on the three axes (X, Y and Z axes) of CNC plotter machine, meaning control on the stepper motors.
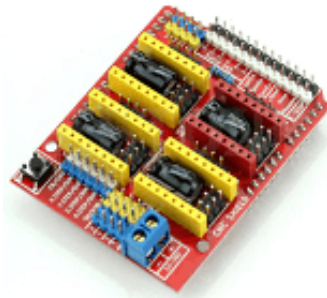
Fig 2. CNC shield V3

3. Stepper Motor

The digital pulse stepper can be converted into the movement of the pen with respect to the X, Y, Z axes directions. The stepper motor is a brushless motor that distributes full rotation in several equal steps [2]. The stepper motor in Fig. 6 is defined by the property of converting several drives to a specific increase in the position of the column. Each pulse moves the column through a fixed angle. This machine has used three stepper motors with a lead screw and two belts. The output of the motor will be in the form of the rotation of the lead screw with respect to the X, Y and Z axis

Fig 3. Stepper motor

VI. IMPLEMENTATION

1. Design

Mechanical Design of CNC Plotter Machine the two dimensional mechanical design of the body of CNC plotter is shown below,
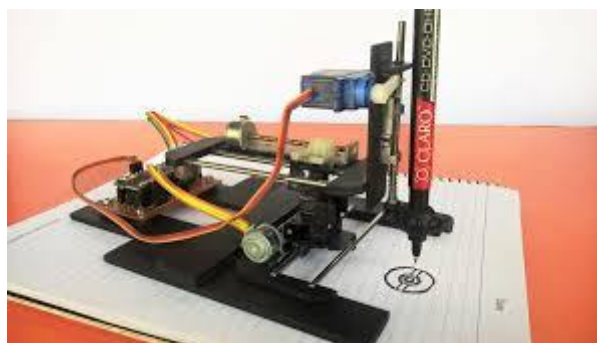

Fig 4. Design of CNC

2. Components Required

To erect the CNC plotter machine, the required components are listed below:
1) Stepper motor (2 pieces)
2) Motor driver module (2 pieces)
3) Servo motor
4) Power supply
5) Arduino uno
6) Gears
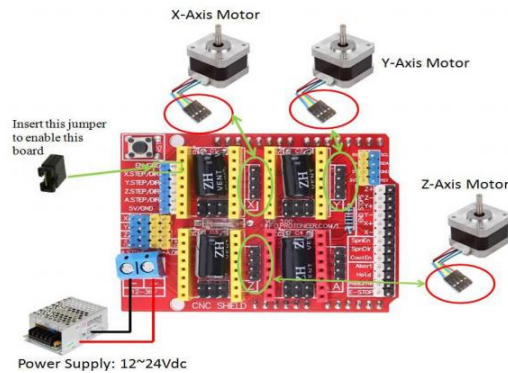7) Pen

8) PCB
9) Connectors and Cables

Fig 5. Circuit Connection of CNC

VII. FEATURE

This project is about building a mechanical prototype of a CNC plotter machine which is able to draw a PCB layout of 20cm by 20cm (or any image/text) on a given solid surface. It consumes low power and works with high accuracy due to precise controlling of stepper motors. This is a low cost project as compared to other CNC product. It is made with easily available components and spare parts. It is designed for private manufacturing and small scale applications in educational institutes. The machine is designed with a very simple construction scheme and can be carried anywhere without much effort. The algorithm used is simple. The pen can be replaced with a pinhead or laser head or any other tool for different purpose of use. Software that has been used is open source and user-friendly. The existing CNC machines are of high cost, difficult to maintain and requires highly skilled operators. Our CNC plotter overcomes these problems. It is of low cost and easy to control and there is no need of highly skilled operators. It can be used for long hours at a stretch which is not possible in existing ones. It is hoped to extend this work for future development.

VIII. CONCLUSION

Finally, after going through all the problems and troubleshooting of hardware as well as software a mechanical prototype of a CNC plotter machine could be made. This project can benefit society and youth in various aspects: Reliable endurance, this machine can run for hours without interruptions. Precision components, this autonomous machining of CNC practically eliminate human error chances up to a very extent. Lower costs, the collective result of the high speed, efficiency, specialization, and precision, all add up to a better bottom line for the future of this model, saving money and time is one of the most popular benefits of CNC machining. Design retention, once a design has been loaded into the CNC machining software and a perfect prototype has been created, the program can easily retrieve the design to run it and create that object. Low maintenance, the g-code based software will automatically update itself when needed, and generally, do not require much services.

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Marine Monitoring & Early Warning Detection Using Wireless Sensor Networks

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Abstract-- Marine monitoring using wireless sensor networks (WSN) is a challenging area of research due to the instability of the oceanic environment. The early warning system for ocean monitoring and defending is an instant need of the hour constraint for avoiding huge losses in marine world. It can be possible using the information gathering technologies, such as ultrasonic, radar, machine vision, infrared, laser, and other integrated technologies, such as Wireless sensor networks, underwater marine detectors and computer information processing. It sound like science fiction, but the fact in today's technology is to know about the complexity in ocean monitoring, managing and protecting the marine safety. This paper mainly focuses on the applications of WSNs and early detection measures of marine Traffic Control Technology using WSNs involved to protect oceanic marine world.

Keywords: Wireless Sensor Networks, Marine monitoring, applications of WSN, Sensor Nodes

I.INTRODUCTION

The only way to save the Oceanic environment is to open up the new ways in which we learn and understand the complexity of marine life, and we can monitor waters and coasts. The key aspect for turning on the vision of saving the marine life put into reality is the availability of an effective and cooperative underwater sensing, reasoning, and communication platform. This makes possible for sensing and actuating devices to exchange data and signals, network (connect) together, collaboratively and locally asses their observation environment and act upon. The Early detection of oceanographic threats and traffic control has been recognized as one of the first priorities and effective ways in saving marine environment.. This paper highlights the main components necessary to form an ideal marine based WSN system, and some projects involved in implementing control and security in Marine WSNs.

II.OBJECTIVES OF THE STUDY

1. A study on the applications of WSNs a
2. To study on early detection measures of marine Traffic Control Technology using WSNs

Research Methodology

The study is based on secondary source

Applications of WSNs:

Let us see few of the real-time applications [4] where WSNs plays a vital role in identifying and detecting the problems in early stages and can take immediate & effective measures to resolve the problem. The following are the different categories of applications based on WSNs,

i.Home automation & Consumer Electronics - Developing commercial application of sensor network is no so hard to imagine. The Home appliance like

□Smoke detectors,

□Refrigerator door detectors,

□alarms, watches, electric kettles,

□sensor doors, sensor lights, etc

ii.Industrial Control & Monitoring - An interesting application to civil engineering is the idea of Smart Buildings: wireless sensor and actuator networks integrated within buildings which allows the distributed monitoring and control, improving living conditions and reducing the energy consumption.

iii.Security & Military Surveillance - Military applications are many.

□ DARPA's[4] is a self-healing minefield, where it organizes by itself in a sensor network and its peer-to-peer communication between anti-tank mines is used to respond to attacks and redistribute the mines in order to heal breaches, complicating the progress of enemy troops.

□ Another application called "Urban Warfare" has distributed sensing lends itself to assemble nodes that could be deployed in a urban landscape to detect chemical attacks, or track enemy movements.

V.Health care - Medical research and healthcare can greatly benefit from sensor networks: □□Sensors used in Vital sign monitoring and accident recognition

□□wearable sensor nodes that can store patient data such as identification, history, and treatments. a

□□sensor that helps in taking care of the elderly people, especially if they are affected by cognitive

decline

III.SENSOR NODE COMPONENTS

The sensor node components of a WSN enables wireless connectivity within the network, while connecting an application platform at one end of the network with one or more sensor nodes or actuator devices in any part of the network. The specific use of components such as gateways and nodes is to create a transparent data path between application platform and the physical world. Wireless sensor networks are used to exchange information between an application platform and different sensor nodes. This exchange takes place in a wirelessly
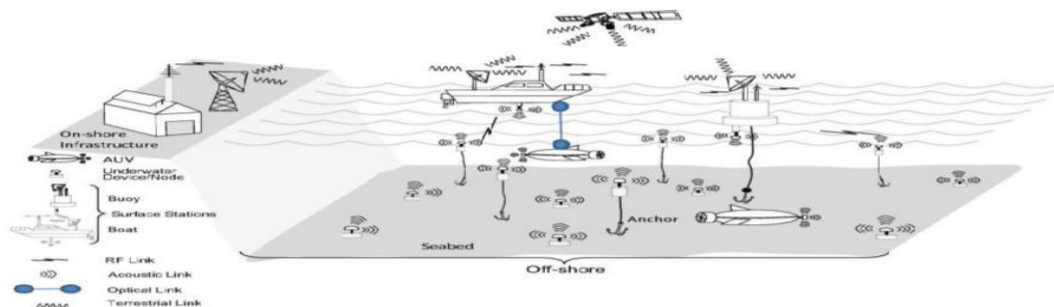
Figure1: scenario of the elements of a sensor nodes

Figure shows the scenario of the elements commonly used in the design and implementation of a sensor nodes. It includes a flotation device such as a buoy to keep part of the node out of the water. This out-of-the-water part always includes an antenna for RF transmission, optionally a harvesting system to supplement the power source. And in some cases there is need to essentially monitor meteorological data with one or more external sensors to control wind speed, air temperature, atmospheric humidity, etc. The AUV (Autonomous Underwater Vehicle) is submerged into the water and is a part of the node is composed of one or more sensors, which may be placed at different depths.

A. Operating systems in Sensor Nodes

The Operating systems that supports Sensors are TinyOS[2] and Contiki[1]. TinyOS [3] is an open source, flexible, component based, and application-specific operating system designed for sensor networks. Tinos can support concurrent programs with very low memory requirements. Contitki is a lightweight open source OS written in C for WSN sensor nodes. Contiki is a highly portable OS and it is build around an event-driven kernel. Contiki provides preemptive multitasking that can be used at the individual process level. A typical Contiki configuration consumes 2 kilobytes of RAM and 40 kilobytes of ROM. These two are the most widespread operating systems. Other operating systems developed for WSNs include MANTIS, SOS, Sensors and Magnetos.

B. Main Tasks of Sensor Nodes:

There are different models for monitoring applications, where the data flows primarily from the sensor node to the gateway, and for control applications, where the data also flows very frequently from the gateway to sensor nodes. The following figure shows the main tasks of sensor nodes which includes

Processing Unit - has a Processor with Storage unit connected to Power Unit works exclusively to process and stores the data and the signals received from the Transceiver and carries forwards to Mobilizer and Sensing Unit for further action.

Sensing Unit - has a Sensor and ADC (Analog-to-Digital Converter) connected to a main Power Unit for power generation. This unit mainly senses the acoustic and radar signals from the water and helps to find the location of AUV.

Transceiver - is connected to a main Power Unit which gives the signals to the processing unit

Power Generator - hold the whole control on the sensor node system and gives the power supply internally connected to each component of the system.

Mobilizer - is a unit which acts a mediator between the signal receiver and the signal generator for finding the location of a any marine vehicle in the ocean.
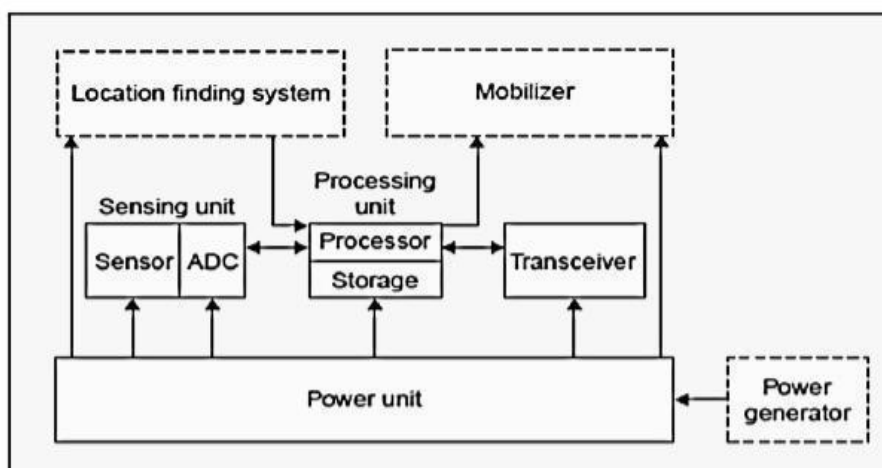
Early Detection of marine Traffic Control:

Due to the characteristics of the water environment, there are certain considerations which must be taken into account before the establishment of marine based wireless sensor networks. The following are some of the most important factors to consider the need of early detection of marine traffic:

•The aggressive nature of marine environment is one of the factors in which it requires greater levels of device protection.

•Allowing movement of nodes must be made for the cause of tides, waves, vessels, etc.

•It is generally necessary to cover large distances, while communications signals are attenuated due to the fact that the sea is an environment in constant motion since the energy consumption is high.

•The price of marine based WSN instrumentation is significantly higher than in the land-sited WSN.

In spite of all these negative aspects, various studies of monitoring of marine ecosystems using WSNs can be found in reviews and literatures. The solutions have in common is that they are largely designed and implemented ad-hoc (buoys, electronics and software), and oceanographic sensors and other related components.

IV.MEASURES TO PROTECT OCEANOGRAPHIC MARİNE WORLD

The deep-seated parameters relating to WSNs, combined with the technologies such as Beidou navigation and positioning, images and meteorological sensor information, geographic information, remote sensing information, forms a marine resource digital information management system that provides a full range of electronic monitoring and protection for the oceans.

What policy planners can save our Ocean [6]

☐ The best plans for developing coastal management plans and marine spatial planning, including marine protected areas.

☐ Increase efforts to develop more sustainable fisheries and aquaculture

☐ Marine World Heritage site managers can be strengthen the network so that they can serve as drivers for ocean conservation to protect our Crown Jewels.

☐ Protection measures to be taken to increase coverage for the most iconic ocean places for under the World Heritage Convention.

☐ Adopt or develop few models for the legal protection of natural and cultural heritage located in regions beyond national jurisdiction. This can be done, through a cooperation model as proposed by the UNESCO Convention on the Protection of the Underwater Cultural Heritage.

V.CONCLUSION

Imagine a world where we just spread a number of sensor nodes in the water, some on the sea floor, others floating at different depths, and these devices were able to communicate with each other, in parallel they organize themselves into a network, exchange data among themselves, identify the regions and resources that are experiencing some phenomenon of particular concern to the user, and eventually deliver this information to one or more collection points where it can be easily and economically accessed or transmitted.

The WSN's aim is to sense, collect and process the information of the objects in the network coverage and send it to the data processing center to provide the basis for ocean monitoring and managing and protecting the marine safety. In turn autonomous underwater vehicles (AUVs) can travel through such systems and by transmitting messages with various sensors, downloads the data and bring it back ashore for the scientists to

examine. Here the data is continuously processed and disseminated in real time, thereby providing a live view of what's happening in the marine worlds to access the threats before a huge loss. Today's technology is in

fact very close to making all these possible by opening up new ways in which we learn and understand the complexity of submarine life, and we can monitor waters and coasts.

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5. Wireless Sensor Networks: Applications and Challenges of Ubiquitous Sensing Abstract © DIGITAL VISION Feature Daniele Puccinelli and Martin Haenggi
6. Healthy Ocean, Healthy People, Know your Ocean – UNESCO Study

Iot Based Smart Garbage Collecting System

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Abstract: In our city many times we see that the garbage bins or dustbins placed at public places are overflowing. It creates unhygienic conditions for people. Also it creates ugliness to that place. At the same time bad smell is also spread. For that we introduce our system to solve this problem. It will save the time and it also prevents the environment from pollution. This method is used automatically to identify the level of bins and the send data to the cloud and display it using webpage or app. Microcontroller is used to process the data from the ultrasonic sensor and the NODE MCU is used to send the data to the cloud. Garbage level can be detected by using the ultrasonic sensor and the GPS is used to find out the exact location of the bin and that information can be send to the truck driver. With the help of that message, truck driver can identify the location and the status of the bins. This method also has temperature sensor to find out the temperature of the garbage bin and the information is passed to nearby fire station using GSM if there is any fire accidents.

Keywords: Automation, GPS, GSM, Temperature Sensor, Ultrasonic sensor, Microcontroller and Node MCU.

I.   INTRODUCTION

India faces major environmental challenges associated with inadequate waste collection, transport and disposal. In the current scenario more wastes are generated in urban area and this impact on the environment and public health. This paper automatically detects the bin location and if the bin is fully filled the truck driver can know the location of it. Usually we need many man powers, by this garbage management system we reduce the man power with the help of embedded system is interfaced with IOT. The embedded device is a low cost device used for automation. In each city more number of bin are located in it.

Everyday truck driver roam around all the places to check the garbage bins but sometimes bins are not fully filled due to population around it. By this method we can know the location of 80% filled been using this information truck driver can create an optimized path for it.

The outcomes of this work are an integrated system model for intelligent waste collection, and the quantification of its benefits and economic costs when deploying and using it for evaluating its feasibility as a real world Smart City application. In addition, this concrete use case illustrates the enormous potential of Open Data and the opportunities that a unified ICT infrastructure dedicated to Smart City oriented services can provide.

II. METHODOLOGY

The components used in the paper are ultrasonic sensor, GPS, GSM, Temperature sensor, Arduino UNO and Node MCU. Garbage Monitoring System has ultrasonic sensor and it is used to detect the level of the bin. The level of the garbage bin can be measured by means of centimeter. The processor process the data from the bin and send it to the cloud and display the level using user interface like webpage and app. GPS is used to detect the location of bin and it is displayed on user interface. Temperature sensor is used to detect the fire inside the bin. As the temperature reaches the critical value, it will send the message to the nearest fire station using GSM.
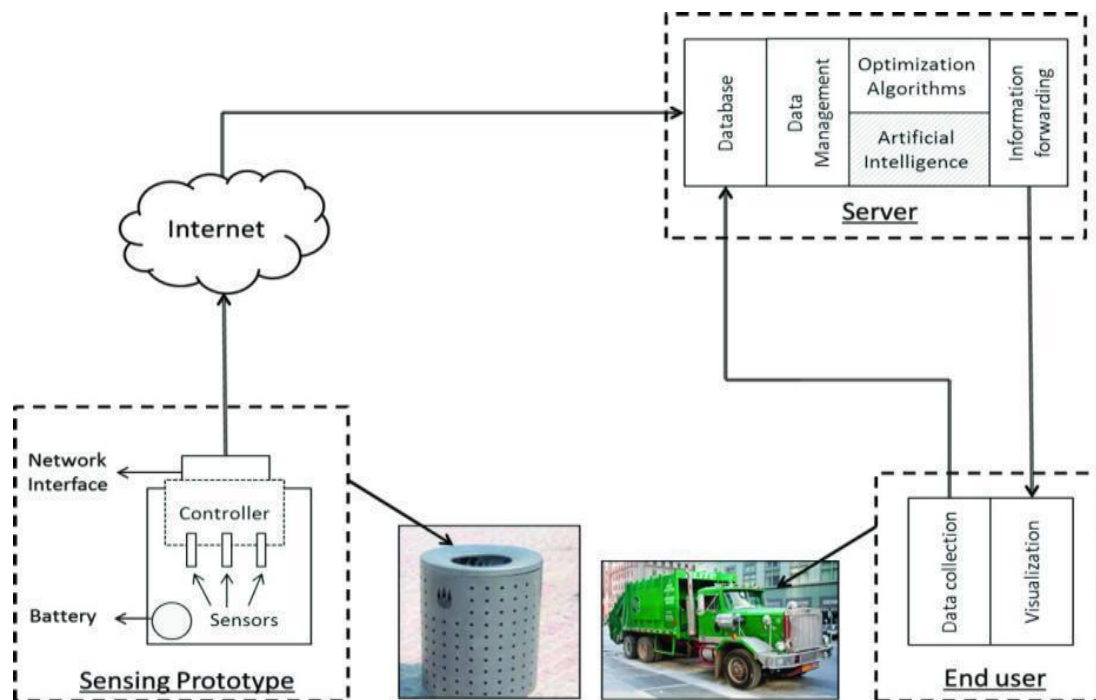

Fig 1: Diagram for Garbage Collecting System

2.1 ALGORITHM

➢ Start Initialize ARM ports pins and init LCD.

➢ Init UART for serial communication and set baud rate (9600).

➢ Init SMS for GSM modem

➢ Init Keyboard.

➢ After initialization, Display project name.

➢ Check receive interrupt flag is generated?

➢ Yes, then check GPS $GPRMC command is received

➢ Yes, and then read the longitude and latitude from the GPS and display on LCD. After receiving coordinate check next condition

➢ Check Dry force sensor pulse is received? Yes, first check dry garbage level and is not overflow?

➢ Yes, then dry garbage container is Open No, Check Wet force sensor pulse is received?

➢ Yes, first check wet garbage level and is not overflow?

➢ Yes, then wet garbage container is Open

➢ No, check level key is detected?

➢ Yes, if 25% level is detected then send location and level % to the PMC using GSM No, check if 25% and 50% level is detected then send location and level % to the PMC using GSM

➢ No, check if 25% ,50% and 90% level is detected then send location.

➢ Yes, then display enter password using KB

➢ Check password is valid?

➢ Yes, then container is activated for empty process?

➢ No, go back to the step number 7…

III. Hardware Required

➢ Arduino UNO

➢ GPS & GSM

➢ Cloud Server

➢ Temperature Sensor

➢ Ultrasonic sensor

IV.   EXPERIMENTAL RESULTS

The sensor based automation system is developed to automate the detection of bin level and bins location. The proposed system uses one ultrasonic sensor to identify the level of bin and GPS is to detect the location of bin. The system also finds out the fire inside the bin after fire is detected GSM used to send message to nearest fire station. Sensors, GSM, GPS are programmed using

Arduino and Node MCU micro-controller. The proposed system is practically experimented as a working model of the real world.

| Fig 4.1: Experimental Setup | Fig 4.2: System Architecture |
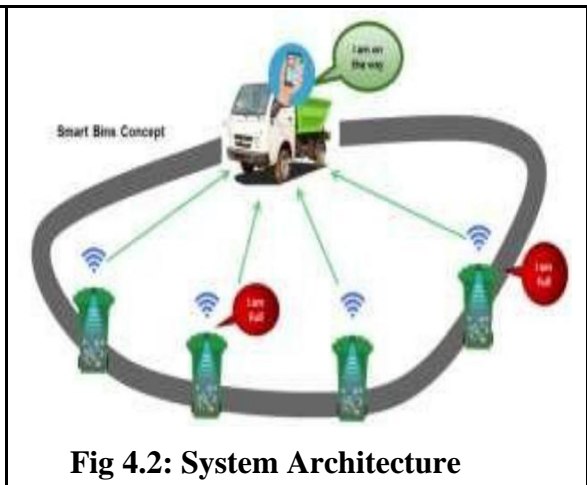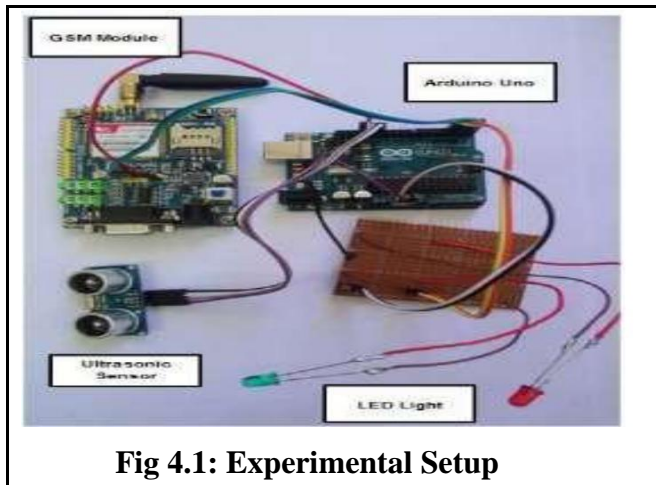
Test cases and Results:

1) Dustbin when empty - 0% (when 1st level IR Sensor gives output)

2) Dustbin half – 50% (when 1st level and 2nd level IR Sensor gives output)

3) Dustbin full – 90% (when all three level sensors gives output)

4) Dustbin is heavy- when threshold weight of dustbin is crossed.

Fig 4.3 : Test cases

V. ADVANTAGES

➢
To collect dustbins placed at public places in city.

➢ This project can also be used in college / university campus

➢ This project can also be used in companies

➢ Many times Garbage dust bin is over flown and many animals like dog or goat enters inside or near the dustbin. This creates a bad scene. Also some birds are also trying to take out garbage from dust bin. This project can avoid such situations

VI.   CONCLUSION

Currently waste collection is a major problem faced b y t h e s o c i e t y .   Using I O T t h e w a s t e collection methodology moves to next level. The waste accumulated in the bin directly affects the environment and also   affects the people's health. To overcome this problem, this paper provides a unhygienic conditions and will make the processing of garbage very easy.

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An Automatic Object Based Efficient And Flexible Spraying Agrorobot For Agricultural Application

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ABSTRACT-The responsibility of controlling and managing the plant growth from early stage to mature harvest stage involves monitoring and identification of plant diseases, controlled irrigation and controlled use of fertilizers and pesticides. The proposed work explores the technology of wireless sensors for remote real-time monitoring of vital farm parameters like humidity, environmental temperature and moisture content of the soil. We also employ the technique of image processing for vision based automatic disease detection on plant leaves. Thus this paper vigorously describes the design and construction of an autonomous mobile robot featuring plant disease detection, growth monitoring and spraying mechanism for pesticide, fertilizer and water to apply in agriculture or plant nursery. To realize this work we provide a compact, portable and a well founded plat form that can survey the farmland automatically and also can identify disease and can examine the growth of the plant and accordingly spray pesticide, fertilizer and water to the plant. This approach will help farmers make right decisions by providing real-time information about the plant and its environment using fundamental principles of Internet, Sensor's technology and Image processing

I. INTRODUCTION

The main business of Indian people is agriculture and the economy of the nation is decided by agriculture. The essential nutrients for plant growth are commonly generates in its surroundings. The plant development process depends on the conditions of the environment, where plant grows.

Temperature is one of the factor that influences the plant development process the most. Each plant species presents a disparate temperature range within which they can grow normally. Above of this range, the processes required for plant's life stop as the enzymes become inactive. The loss of moisture from the plant is controlled by the humidity. As humidity increases the plant's development process will also get affected because fungal diseases will spread rapidly and air will also become saturated with vapour which will than restrict transpiration [5]. The productivity of the crop is also affected by other major biological parameters such aspects, disease and soil. Soil moisture is the key parameter which can be used to determine the right time to irrigate and right amount of water to supply. These parameters can be controlled by human beings for improvising the production of crop[14].

II. PROPOSED SYSTEM

Figure1 displays the block diagram of the proposed system. Each block shows an important element of the system. As can be seen ARM7 is used as the control unit. Various sensors also have incorporated for environment monitoring. Three water motors are included for spraying purpose of each liquid. Webcam has been included which enables the vision capability of the system. Zigbee and GSM are used for wireless communication purpose.

III. DESIGN CONSIDERATIONS OF THE SYSTEM

In the present situation any system design is incomplete without a software and hardware combination. The system proposed insection3 is detailed in further two sub sections.
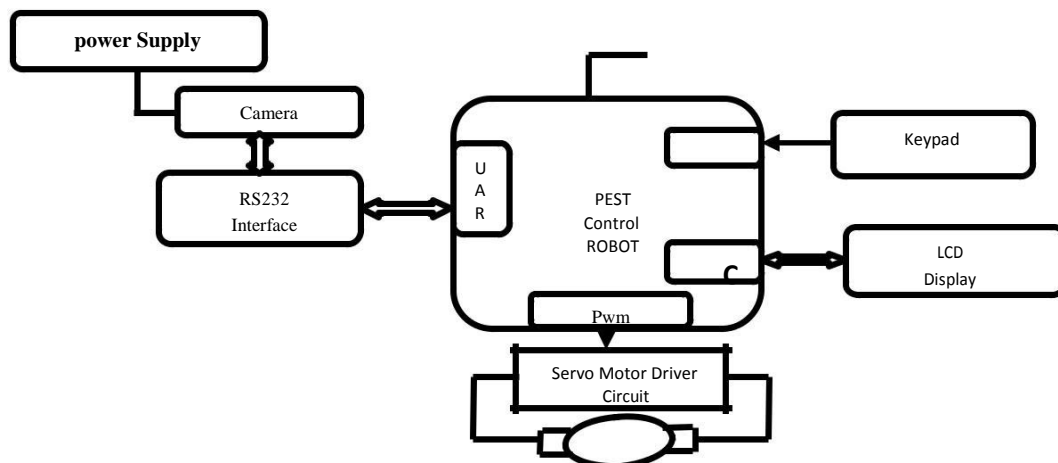
Fig.1. BlockDiagramoftheproposedsystem

3.1.Hardware Details

The hardware part consists of a microcontroller ARM7, three sensors(Humidity sensor, temperature sensor and a soil moisture sensor), as shown in figure it has three container of 500ml for spraying of pesticide, fertilizer and water. Two dc motor are required to physically run the robotic buggy. A webcam is used for capturing the images of plant through MATLAB Command, in WIFI environment. Along with it system has GSM modem for sending SMS to farmer and personal computer with MATLAB software.

3.1.1.Systemcontrolsection

The system's controlling part is composed by LPC2138 microcontroller as the core controller. The LPC2138 microcontrollers are based on a 32/16bit ARM7, TDM ISCPU with realtime emulation and embedded trace support. I thas64 pins.

3.1.2.WirelessSensorUnit

The sensor us made up of a RF transceiver, sensors, a microcontroller, and power sources. Here the wireless sensor unit is based on the microcontroller LPC2138 that controls radio modem ZigBee and processes information from the soil moisture sensor ICLM358, Temperature sensor LM35 and humidity sensor(Precision Centigrade Sensors).

3.1.3.DriverModules

DC motors are used to physically run the application as per the requirements configured in software. The dc motor operates on 12v. To drive a dc motor, it requires a dc motor driver called L293D.

3.1.4.TrolleyModules

Trolley module is a carrier trolley that carries the liquid tanks and the entire hardware system. Our main challenge was to design an adjustable chassis which could carry a load of 5-10Kgs. Hence chassis of the vehicle is made up of wooden and it can step in a variety of composite cement road pavement, littlie mud, gravel, grass etc.

3.1.5.SprayModules

Spray module composed of a spray head, pumps, relays, Servos, and DC machine. The spray system consists of three tanks. The valves are controlled by the on-board microprocessor electronically. As the robot passes over reflective places on the ground as per the plants distance, the pump is turned on and off to enables electives praying of the diseased.

3.2.SOFTWAREDETAILS

In order to build the disease and growth identification capability of ROBOT, image processing technique has used. The basic steps, involved in this technique are acquisition of an image, image preprocessing followed by segmentation, feature extraction and then statistical analysis and classification MATLAB Software isused for disease detection and growth measurement based on various algorithms that configure the software part of the system.

Fig.2.Experimental Agriculture Robot field setup

3.2.1.Image Acquisition

The initial stage of a vision system is the acquisition of an image. Image capture module comprises of a camera(webcam) or a android mobile phone camera and wireless fidelity(Wi-Fi) internet connection. Today with the help of Android based OS and its applications an image can be directly fed from the mobile to MATLAB. IP webcam app and Wi-Fi are required for image acquisition.
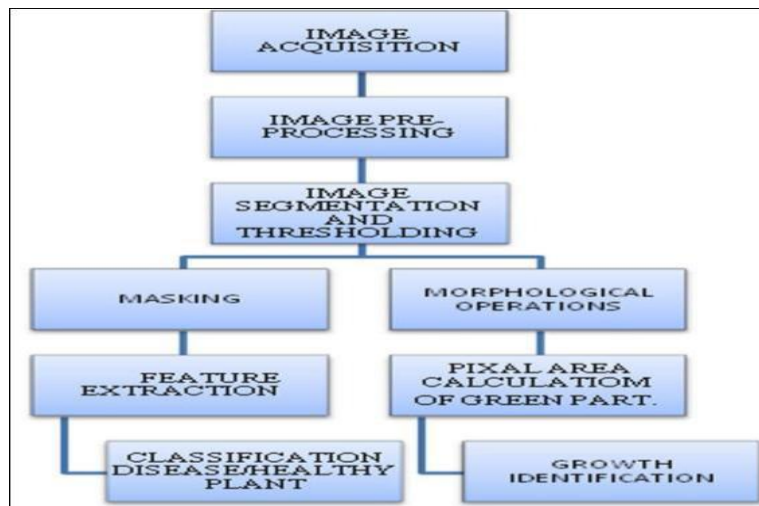

Fig3. Flow chart describes the flow of the system for disease
Detection and growth identification

3.2.2.ImagePre-processing

Here, in this project, conversion of the RGB image to the HIS image is done. For traditional image processing functions, HIS color space is the best which functions by manipulation of the brightness values as I uniformly dependants on R,G,andB. The HIS color space provides a greater dynamic range of saturation hence it isused for hue and saturation manipulation(to adjust the amount of color). H represents hue that specifies the color purity, S indicates saturation and I express the light intensity. As for image processing the colour space selection is an essential step. The HSV(Hue,Saturation,Value) colour space have been selected for growth detection in this project [9]. RGB color spaces frequently used color space, there is high correlation between R, G, and B. Using these values directly would generate unsatisfactory results. To diminish the correlation between R, G, and B, it needs to transform RGB color space to HSV. Image Segmentation.

To separate different regions in an image that do not intersect each other, image segmentation is used[13]. For the purpose of disease detection on plant, image segmentation is done using K-means clustering[2]. The K-means clustering algorithm attempts to classify objects (pixels in our case) rested on a set of features into K number of classes. The classification is done by minimizing the sum of squares of distances between the objects and corresponding cluster or class centroid.. Three clusters proved to be sufficient in this project. After that the masking of the green pixels are done on the boundaries. Two steps are involved in this: At first most of the pixels of green color are recognized after wards to obtain varying threshold value Global image threshold has been applied .The green pixels are then asked as-If pixel intensities have green component less than the calculated threshold value then this pixel's R, G and B components are vanished. Second step requires deleting pixels with zero components, and those at the boundaries of the infected clusters.

3.2.5. IMAGE PROCESSING RESULTS AND ANALYSIS

For disease detection on plant leaf at first image is captured and segmentation is performed with k mean clustering. After that region of interest (ROI) is selected by choosing a particular cluster containing part of diseased area. Figure5 shows the algorithm implementation steps for disease detection. Figure6 shows the image processing result of disease detection.

To find growth of the plant at first the images of the plant are taken by the android mobile camera through MATLAB command. After acquiring the image firstly, the conversion of RGB to HSV was made to as HSV

Fig6. Disease detection after segmentation.

Fig7. Growth identification of plant

(a) Original image
Calculation

(b)Leaves are a pixels

Fig8.MATLAB output for disease and growth identification

IV.CONCLUSION

An automatic robotic system spraying pesticides, fertilizer and water to plants and controlling the robot wirelessly is a great alternative to manual completion of crops spray test as it reduces labour and protect from the direct exposure of the human body to pesticides and thereby reduces pesticide harm to people, and also improves production is efficiency.Using image processing technique for disease detection in real time is difficult task because of sun light, background and some other obstacles which may affect results sometimes.Still the proposed system and algorithm was tested with plant and result. were found to be satisfactory. The motive of identifying disease on the leaves and the growth of the plant was successfully achieved. The proposed system is a prototype which shows how one system can be used to overcome many problems in a farm land.

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Smart security device for the protection of women

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ABSTRACT:

Now-a-days women are facing many problems based on their security. The application which is proposed has access to track location and will send messages to the nearby police stations and the scanned phone numbers. This application is not only used for cases like rapes and any perverts teasing girls but this also helps them from any bad condition or any health problem like fainting suddenly. GPS is to track the location of the victim and to send messages, the location of the victim to the nearby police station and the phone numbers of the relatives of the victim. This application helps women to overcome their fear in going out and do things what they like to do.
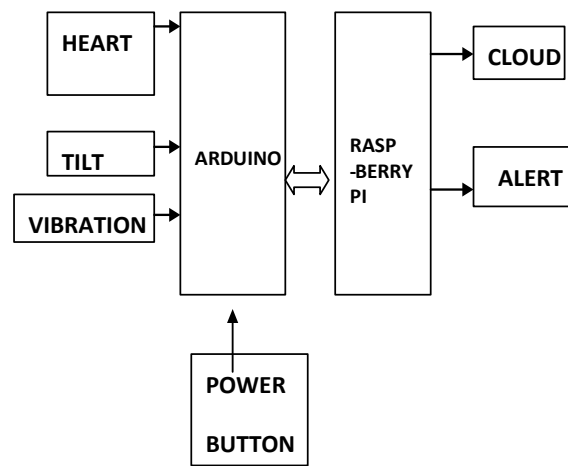
INTRODUCTION

Physical devices through which all electronic devices is called the Internet of Things, cloud computing and sensors are connected. The privacy is very high in the Internet of Things. It is very helpful to people to develop a smart-based security. The sensors are developed in such a way that there is a automatic response without any triggering buttons. This can help people can overcome difficulties like women security, constructing smart city. Multiple sensors like flux sensor, vibration sensor, tilt sensor, heartbeat sensor and GPS are used for safety purposes. The GPS is used to identify the location. Heartbeat sensor is used to identify the heartbeat level, IOT is used to send the location and message to nearby police station if there is any high change in the heartbeat level. If any harassment , there may be chances of bending, inclinations, vibration and any bending are noted by tilt sensor, if there are different changes than the message is sent. Arduino, Raspberry pi3 are used in the proposed system. The application proposed gives the security system which is designed to help women to do their work with comfort and can to the places they wanted and work with comfort. Body sensors and GPS is used to track location and send messages to nearby police station and relatives.

LITERATURE SURVEY

Orlando pereira, et al (2010) proves the theory of using body sensors by using Network mobile solutions for biofeedback monitoring. The SHIMMER firmware and bluetooth firmware has been implemented in this work. The limitations of this work is bluetooth should be always connected to phone, it cannot be used if phone is lost[1]. MirjamJutila, et al(2014) proves the new concept of a wearable sensor vest for children. Safety vest Design, Gateway Implementation, Sensor web elements has been implemented in this work. The

limitations of this work is the device used is very big in size, it cannot be carried to places all can go [2]. Samuel Tanga (2016) proves the concept of sensors in his work" Development Of Prototype Smart Home Intelligent Lighting Control Architecture Using Sensors Onboard A Mobile Computing System" . "Luminaire controlled by the Arduino microcontroller" has been implemented. The limitations of this concept is wifi or internet is needed to work the application[3]. Threats in Information Security are life-threatening more particularly in medical field. [4]. Software providing more features and more security leads to increased execution time and also leads to poor usability of the software [5]. The application can be secured with fingerprint authentication for providing more security and to avoid false positive [6]. The Dynamic Cognitive System shows how the application can be protected against vulnerabilities and attacks in the social network [7].Parthsethi et al(2018) proves the theory of using alarm system in his work published in "Safe sole Distress Alarm system for female security using IOT". "Central controller, GSM module, GPS module gesture control System, smart phone connecting". Limitations of this work is the click in a mobile is needed there is no automatic detection[8]. Phooshkarrajiv et al(2016) proves the theory of using "Email in email based Remote access and surveillance system for smart home infrastructure". "The Email from embedded system to user and reply processing has been implemented in this work". The limitations of this work is the application is very costly and GPS and GMS are not used[9].   Enji Sun et al(2011) proves the concept of IoT and cloud computing in his work "IoT and cloud computing based dam monitoring and alarm system in mines". The limitations it is not automatic. It should be switched on by external activity[10]. Zhen yan et al(2014) proves the theory of using Internet of Things in his work .A system model of Internet of things has been implemented in his work. The limitation of this work is poor in work and setup takes a long time[11].   AlessioBotta et al(2015) proves the theory of integration of cloud computing and Internet of Things: A survey. RFID and wireless sensors, cloud computing has been implemented in this work. The limitations of this work is that the system is very poor in working. It is very costly to afford by poor people[12]. Luigi Atzori et al(2012) proves the new concept of social Internet of Things in his work . He claims how cloud and Internet of things are integrated. The limitations of this work is how the system works is not clearly mentioned[13]. S.Sicari et al(2014) proves the new concept of "security and trust in the internet of things" in his work.   He claims that security, trust, privacy and authentication has been implemented in this work. The limitations of this work is security and authentication of the Internet of things is showed, but how sensors are connected is not showed[14]. Andre Gloria et al(2017) proves the new concept of IOT gateways in his work. The concept of IOT gateways, multiple communication protocols has been implemented in this work. The limitations of this work is a lot of hard work is needed to implement this and the application is also very costly to be implemented[15].

HEART → ARDUINO
TILT → ARDUINO
VIBRATION → ARDUINO
ARDUINO ↔ RASP-BERRY PI
RASP-BERRY PI → CLOUD
RASP-BERRY PI → ALERT
POWER BUTTON → ARDUINO

Carolyn Whitzman et al(2009) proves the new concept of women's safety in his concept .He claims that there should be some safety measures that should be taken by the women in the society. The limitations of this work is only the security of women is discussed, but the device has not been implemented[16]. Minchen et al(2016) proves the concept of smart clothing, in his work "Connecting human's report with clouds and big data for sustainable health monitoring". Intra smart clothing system , communications for Inter smart clothing sustainable health monitoring for chronic diseases has been implemented[17].

Mandeep Singh (2015) proves the wireless integrated device in "AN IoT security model design and validation of Android based wireless Integrated device for health monitoring. A devicce for body parameter measurement with the set of measuring algorithms and the mobile phone to increase tele medical capacity" has been implemented. Limitations of this concept is this an android application and the victim cannot be in a position to open phone and click on the application for help [18].
Susana P.Costa(2015) proves the concept of wearables in his work "Integration of wearable solutions in AAL environments with mobility support. AAL, wearable solutions for a mobile environment" has been implemented. Limitations are, although it is a wearable device, it just needs a click to activate the wearables [19].

John Ayoade (2007) proves the concept of RFID in his work "Roadmap to solving security and pure concerns in RFID system. Supply chain effectiveness, waste disposal has been implemented[20]. Rolf H. Weber(2010) proves the concept of privacy and security in his concept.

MOTIVATION

The challenging situations facing by each women now-a-days gave motivation to come up with a security device to help the women to do the work they liked to do. The application helps women to over come their fear and can roam freely and complete their works.

PROPOSED SYSTEM

Multiple sensors are used such as heart beat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the heartbeat, declination, vibrations of Heartbeat sensor is connected to the Arduino. The range of heartbeat is adjusted using

Arduino c software. Tilt sensor is also connected to Arduino-uno board to get if there is any declination. Vibration sensor is also connected to Arduino-Uno board to notes the vibrations, (if there is any different or abnormal vibrations). The readings are noted for every 20 milliseconds delay.

ARDUINO

Arduino is a micro controller to which sensors are connected. It can be purchased either online or in any stores. Arduino looks like a credit card sized board. There are many versions of arduino. In this application arduino-Uno board is used. BY using cable Arduino board is connected to laptop to get power. Arduino -UNO board is used in this application.

RASPBERRY PI 3

Raspberry pi is a series connected credit card sized microprocessor. There are different types of raspberry pi. It has a high speed connection compared to other raspberry pi and it has storage up to 1 Giga Byte. It is set in a way that the health condition of the person who wears this device is noted and stored in the cloud for every 20 milliseconds It is a micro processor to which GPS is connected and every record of health condition of women is noted and stored in the cloud and if there are any variations or any severe conditions the GPS sends the messages to the nearby police station and relatives.

HEARTBEAT SENSOR

Heartbeat means the heart contrasts and expands while pumping blood, the sound is heard while doing. The average heartbeat range for human is 72 per minute, if heartbeat rate is too low it means there may be any bad health condition, high heart beat rate, then there is a big tension faced by the victims. If there is a heavy change, the record of women is taken for every 20 milliseconds then the messages are sent to the nearby police station.

VIBRATION SENSOR

Vibration sensors are used for touch and vibration measurement. whenever a women moves, there will be acceleration. A vibration is generated when it is physically accelerated. There are different vibrations for different sounds. The track of vibration is noted for every 20 milliseconds. If there are different vibrations noted then the location is tracked and messages are sent to the nearby police station.

TILT SENSOR

Tilt sensor allows you to find orientation or inclination. These are low budget and easily used. They will not be damaged if used properly. The simplicity of tilt sensor makes popular for toys, gadgets and appliances. These are also called as "mercury switches", "tilt switches" or "rolling ball sensors" for their perspective reasons. If there is any inclination or orientation, the records will be recorded for every 20 milliseconds and if there is any bad issue, action will be taken.

GPS/GMS

GPS is used to locate the longitude , latitude of the victim. The GPS tracks the location of the victim if any of the sensors shows bad output. The latitude and longitude of the

location is tracked and the location is sent. In this we use c programming to send the messages by using SMTP protocol.

ARDUINO C

Arduino c software which is used to take the details of micro controllers or sensors. C programming language is used to adjust the range of sensors.

IMPLEMENTATION

Arduino - Uno board is used as a micro controller. These sensors are connected to the Arduino - Uno board. Heart beat sensor is connected to the S1 pin and the s1 pin is input. S2 pin of Arduino - Uno board is connected as output to heartbeat sensor. Hand is placed on the heartbeat sensor, Arduino board is connected to the computer by using a cable, by using Arduino c software the readings are noted and for every 20 milliseconds delay the readings are noted.

Tilt sensor is also connected in same way as heartbeat sensor is connected. Tilt sensor gives bending or inclination in all directions.

Vibration sensor is also connected in the same way as the above sensors. Vibration coming from all directions are noted in this sensor.

Raspberry pi3 is a microprocessor, it is connected with Arduino. GPS is fixed in the raspberry pi. If there is any emergency message will be sent to the nearby police station.

COMPARISION

In Existing System, many applications such as mobile applications like "HELP ME ON MOBILE" is developed. *91# codes are also developed. If there is any emergency to that code women either call or send message

In Proposed Work, multiple sensors like the heartbeat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the condition of women if there is any emergency the message and the location is automatically sent to nearby police station and relatives.

The Existing system needs a single click to get help. At sometimes women in the situation where a single click also cannot be done. May women be in a block out stage. At that time, body sensors help her to detect automatically.

CONCLUSION

A safety device for women, which can be carried using GPS and three different sensors has created. This may help women when there is any emergency.

The GPS sends message automatically to the nearby police station and relatives by tracking their location. This may help women to move freely wherever she wants.

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IoT Based Controlling of Advanced Hybrid Energy System for Industrial Applications

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ABSTRACT- *The controlling of hybrid energy system using IOT. The main criteria being switching between the sources of solar energy wind energy and piezo electric power without any inconvenience through a website using ESP8266 Wi- Fi module. This system helps the user to control the sources of energy, manually and remotely using smart phone or personal computer. User can control, monitor and operates the system when he is away from various places. To generate continuous power from solar and wind energy. There is various combination of energy and all of them are alternative to each other like solar energy, wind energy, bio fuel, fuel cell, etc. But the need of controlling of hybrid energy system arises when it is installed for domestic or commercial purpose. At this point IOT plays an important role in controlling system. The main criteria being The data is transmitted wirelessly through website to ESP8266 module which controls the sources of energy. The transmitted data is controlled remotely using IOT. This enables user to have flexible control mechanism remotely through a secured internet web connection. This system helps the user to control the sources of energy, manually and remotely using smart phone or personal computer. This system is very efficient, cheaper and flexible in operation.*

I.INTRODUCTION

Now a day's world energy demands are increasing, but fossil fuels are depleting. Electrical energy generated from conventional sources coal, diesel and nuclear. Solar and wind energy are good alternative & easily available. Hybrid energy system is combination of two or more energy system.IOT used to controlling of the load through secure website, easy to control and operating the system. Electricity could be saved, no power cut, continuously power to load**.** Energy is the basic need for development and the requirement of energy is more due to the rapid increase in world population, technology and other political and economic condition. Now a day's electrical energy is generated by the conventional energy resources like coal, diesel, and nuclear etc. and these are depleting day by day. So, there is an urgent need to switch on to non-conventional energy resources. Solar and wind are easily available in all condition can be good alternative source. With the rise in the demand of renewable energy resources the need of better utilization of these systems has aroused. With the advancement in technology provide sensors, metering, transmission, Distribution, and flexibility to consumers of electricity, it can be possible to control the sources of energy of a house by this prototype.

II.SOLAR-WIND HYBRID ENERGY SYSTEMS

Energy resources are classified into two ways:

• **Non-renewable Energy**: Resources which are limited in quantity and can be depleted after few years. Example: Petroleum, Natural gas, Coal etc.

• **Renewable Energy**: Resources which are abundantly available in nature. Example: Solar energy, Wind energy, Tidal energy etc.

A. Solar PV cell

Photovoltaic cell absorbs light energy (photons) from the Sun and converts it into electricity by the photovoltaic effect. Lots of modules are used to make wafer-based crystalline silicon cells or thin-film cells. The load contained number of modules that can either be the upper layer or the lower layer. It must be shielded from mechanical harm and humidity. Nearly modules arerigorous, but on the basis of thin-film cells, semi- malleable ones are feasible. All cells are connected in series electrically to each other.

B. Wind Mill

A windmill is a machine that converts the wind energy into rotational energy with support of vanes called blades. Wind turbines are the evolutions of the typical windmills that can be observe in more rural areas of the world. Their purpose is to lessen reliance on fossil fuels to create energy and also to create energy in a less wasteful manner. They function by using the kinetic energy of the wind, which pushes the blades of the turbine and spins a motor that transform the kinetic energy into electrical energy for consumer use. They supply clean and renewable energy for both home and office.

III.EXISTING SYTEM

One source of energy system used, does not produce large amount of power and using conventional energy sources. Solar panel should be fixed. Using 2G Wi-Fi modules. Cannot control, monitor& operating their loads. Manually controlled, network should be slow and operates in less speed. With increasing of global warming and the depletion of fossil fuel reserves, sustainable energy solutions to preserve the earth for the future generations. Performance of the system is less. Increase the size of the stepper motor used for the wind and solar. Make the entire system more portable. This could be accomplished by using a durable light weight plastic and decreasing the size of the base. Different time period has been used for calculating power and efficiency. In future using solar panel and wind generated for all domestic, industrial and colleges more energy can be received from the hybrid system, energy requirement from the government can be reduced.

IV.PROPOSED IOT SYSTEM

Rotatable solar panel should be used.ESP8266 Wi-Fi module is used to transmit and receive the electrical data wirelessly through the website and control the system. In this system we using two or more energy system and producing large amount of power &to run the industry. Only used renewable energy sources, Load can be controlled by long distance. In this system are operating in secured website. Reducing manual efforts and time bye control the system. User can easily interact with load, eco-friendly and prevents accidents**.** The structure of the design and development of the proposed system is provided in the following sections.   Describes the working description of developed system. ESP8266module is used to transmit and receive the electrical data wirelessly, which is collected from internet through designed website and the control system. The ESP8266 transmitter is interfaced with various sensing devices and reliable data reception at a receiver side of ESP8266 module. The ESP8266 receiver has been interfaced through router which is connected to the internet. The Load can be monitored and controlled remotely. The controlling operation is performed in two ways. Those are manual controlling and remote controlling.

• Manual control: An on/off and source change switch is provided directly to the system. In this mode user can manually operates the load without following remote control. Manual control is very adaptive.
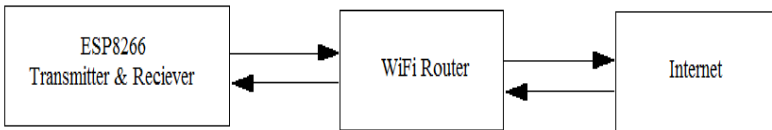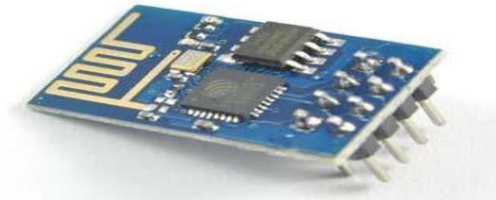
Receiver section of smart controlling system

Fig *ESP8266 WiFi Module*

ESP8266

ESP8266 is a system on chip (SOC) and Wi-Fi network that can carry software applications. It also has TCP/IP protocol that permits to access Wi-Fi network. The ESP8266 is efficient to host an application or remove all Wi-Fi networking functions from another application processor. The flash memory can be started straightly from an external move. In-built cache memory will help upgrade system performance and curtail memory requirements. Another condition is when wireless Internet access

considers the task of Wi-Fi adapter, you can integrate it to any microcontroller-based design, and the connection is uncomplicated, just by SPI / SDIO interface. The module has very good processing and storage capability. This allows it to integrate via GPIO ports sensors and other application specific machine with the lowest development in early and least loading during runtime. The ESP8266 allows very less external circuitry due to the highly integrated chip. It includes antenna switch and front-end module, including the entire designed to minimize PCB area.

ATMEGA328 MICROCONTROLLER

The ATmega328 is single chip microcontroller. It has modified harvard architecture 8-bit RISC processor.Atmega328is very popular microcontroller chip. It is used in popular arduino Duemilanove boards. It is low cost, wide availability, free development tools & serial programming. By executing powerful in a single clock cycle.

RELAY

A relay is an electrically operated switch. Relay is an electromechanical device uses in small electrical currents and voltages to control large voltage and currents. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relay have two switch positions and most have double throw switch contacts.

ROUTER

A router is networking gadget designed to receive, analyze and transfer incoming packets to another network. It is a networking device which forwards the data packets and performs the "traffic directing" functions on the Internet. A data packet is usually forwarded from one router to another over the networks that establish the inter-networking until it enters its destination node [8].

VOLTAGE REGULATOR [AMS 1117-3.3]

This is a flexible and immovable voltage regulators are

designed to provide up to 1A output current and is operated on 5V input. The dropout voltage of the device is guaranteed maximu1.3V, decreasing at lower load currents. Power source circuitry and regulator in both to lessen the stress unde situation to limit current. Low current drop. It converts 5V, 0.7A into 3.3 V for ESP8266 module. There are three pins,
• Ground
• Output (3.3 V)

• Input (5 V)
OP-AMP [AP 358]
It consists of two independent, high gains; internally
frequency compensated operational amplifiers that are designed specifically to work from a single power supply over a wide range of voltages. The rating is ±15V power supply with 1 A current. The output voltage is +5V.
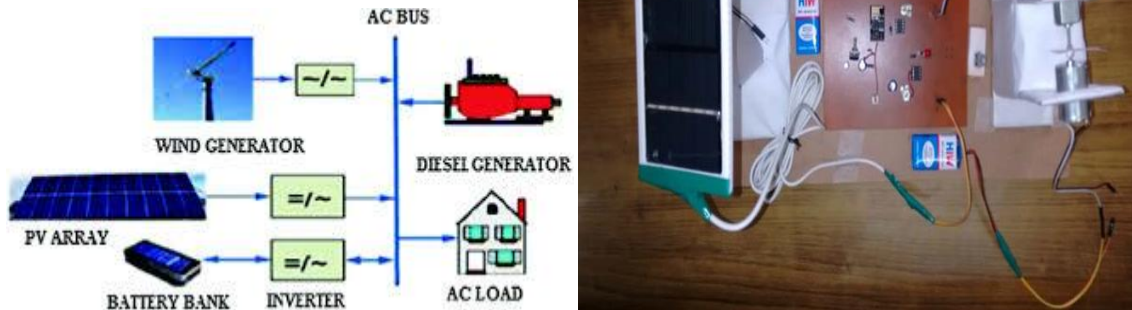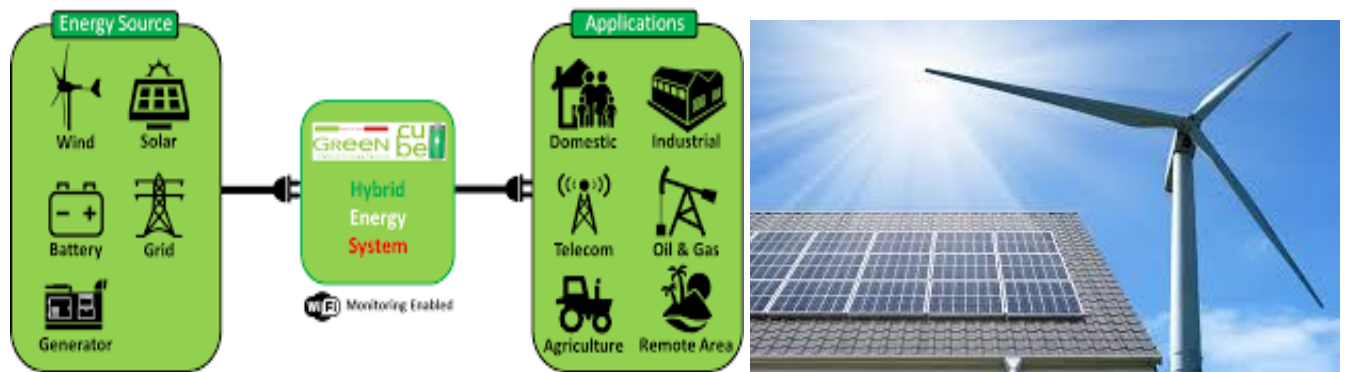

Fig:Prototype of the Controlling of hybrid Energy system

V. IMPLEMENTATION

Block diagram of the control system. The main power supply is 220V AC and an adapter is used to convert 220V AC into 9V dc to charge a battery. The battery is connected to the system and it is of 9V. This 9V is supplied to AMS1117. AMS1117 is a voltage regulator, it is used to convert 9V into 3.3V for ESP8266 WiFi module. Since ESP8266 Wi-Fi module will only work on 3.3V supply above this voltage, it will burst out or not work properly. There are two capacitors used with the AMS1117 voltage regulator, one is of $0.1\mu F$ and other is of $100\mu F$. The application of these capacitors is to filter the current because all components work on DC current.

VI.RESULTS AND DISCUSSION

A. Experimental setup
The system consists of two nodes. Two nodes are Solar panel and wind mill power. Nodes connected with two Op-amps AP358 respectively and interfaced to Esp8266. An LED bulb controlled using this Op-amp.

B. Data transfer
Using Arduino IDE C++ program is uploaded and a variable

is created to store data, which is getting by clicking the button inthe website, it send data directly to ESP8266 module through internet. The data received from the internet is stored in the ESP8266 module. For each signal to be analyse module gives a domain id and API key. Domain id and API key are uploaded in the module and then code is executed in order to update the values in Esp8266.

C. Client server Communication

The client-server communication is done by using HTTP communication protocol. The commands and arguments are passed in between client and server. The output of sending and receiving data can be figured out in Fig.8.

D. Web Server for controlling Hybrid energy system

When module is interfaced with internet, it generates a unique IP address. The webpage is designed so that when IP address is provided in the URL to the control page as opens and user can control power supply by selecting buttons solar on, wind on or off. Internally when user selects the these button internally, Remote procedure call (RPC) commands are initiated for controlling op-amp. When power supply is cut off, person can switch power to another power supply(either solar or wind, which is more feasiable). With just a single click the whole system could be controlled. Operating time from Virtual button to output is minimum 3 seconds. By changing the module to ESP-12 module and increasing the number of Op-amp AP 358 IC, more energy sources could be added.

VII.CONCLUSION

This combination of solar-wind energy source will be highly effective in commercial areas. It is eco-friendly at the same time prevents accidents due to lightening. It is used to cut short power charge. By this system electricity charge could be saved as very less maintenance charge is required for equipment. Moreover there is no power cut or load shedding at any times. In addition to this, the system is controlled by INTERNET OF THINGS as site manager is able to receive detailed information of facility at site, efficient maintenance for regular checkup and failure could be performed conveniently. It is the most reliable and cost efficient. This research is at an underdeveloped stage and may take years to bring it into market. We encourage the scientific community to consider this technology along with others when contemplating efforts and resources for renewable energy. Under the circumstance of power failure this hybrid system keeps the continuity of supply without producing any pollution. High efficiency than individual systems.

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Design of 32 Bit Vedic & Array Multiplier

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ABSTRACT – Multipliers are the fundamental components in many digital signal processing systems. Many import signal processing systems are designed on VLSI platform. In the VLSI system design performance area and power consumption are three important parameters of which power consumption the important factor to be considered. The largest contribution to the power consumption in multiplier is due to generation and reduction of partial products. So it is very much important to know the efficiency of different multipliers. One of the major components required to design a multiplier is Adder. In the existing system the execution time for most processor is dependent on its multipliers and hence need for high speed multiplier arises. The results are simulated for both Vedic & array multiplier for 16-bit length data only. In the proposed system is to simulate both Vedic and array multiplier using 32-Bit length. The advantage is high speed, reduce the time and LUT (look up table) The aim of this project is to provide a fast multiplier in VLSI domain.

I. INTRODUCTION:

Multiplication is most useful arithmetic operation and widely used in Microprocessors, DSP and other Communication applications. Most of the DSP algorithms require real-time processing with several multiplications. Multiplication is the steps of adding a number of partial products. Multiplication algorithms differ in terms of partial product generation and partial product addition to produce the final result. For higher order multiplications, a huge number of adders are used to perform the addition of partial product. The speed limitation is largely associated with conventional multiplier architectures due to the latency introduced by number of adder structures. For high speed processors requirement, the need of high speed multiplier is increased. An efficient multiplier unit is designed in term of low power consumption, high speed, low area, minimum delay .The conventional mathematical algorithms can be simplified and optimized by the use of Vedic mathematics. By using this technique we can increase the computational speed of processor to perform fast arithmetic operations. Vedic multiplier (VM) is the fastest multiplier and it is based on Vedic multiplication formula called sutra. The main advantage of Vedic Multiplier is that the generation of partial product and their addition are done concurrently. Vedic techniques reduce the complexity, execution time of the system, power, area etc

II. ARRAY MUTIPLIER:

Array multiplier is an proficient layout of a combinational multiplier. Multiplier circuit is based on add and shift algorithm. Every partial product is generated by the multiplication of the multiplicand with one multiplier bit. The partial product are shifted according to their bit orders and then added. Multiplication of two binary numbers can be obtained by using AND logic gate that produced the product bit. The various product

terms generated by an array of AND gates are given to the Adder array. In array multiplier, let us consider two binary numbers A and B, of m and n bits, being the multiplicand and multiplier respectively. The m n summands are produced in parallel by a set of mn AND gates. Here, n x n multiplier requires n (n-2) full adders, n half-adders and n2 AND gates. Also, in array multiplier worst case delay would be (2n+1) td. To simplify the concept, for 2X2 bit multiplication, assuming A = a(1)a(0) and B= b(1)b(0), the various bits of the final product term P can be written as:-

$$P(0) = a(0)b(0)$$
$$P(1) = a(1)b(0) + b(1)a(0)$$
$$P(2) = a(1)b(1) + C1;$$

where C1 is the carry generated during the addition for the P(1) term. P(3)=C2; where C2 is the carry generated during the addition for the P(2) term. For the above multiplication, an array of four AND gates is required for the various product terms like a(0)b(0) etc. and an Adder array is required to find the sums involving the various product terms and carry combinations mentioned in the above equations in order to obtain the final Product bits
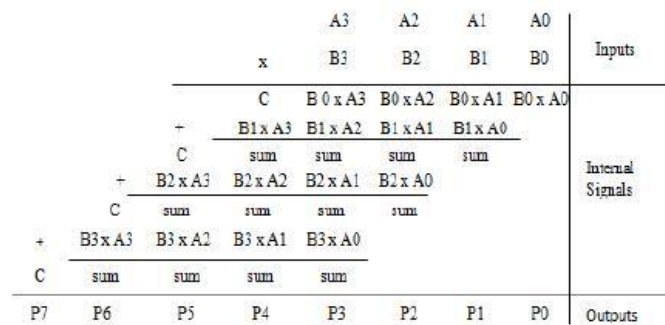

Fig 1:Method of Array Multiplier

In fig.1, describes the 4x4 multiplication process using array multiplication method, say
A= A3 A2 A1 A0 and B= B3 B2 B1 B0. The output line for this multiplication is P7 P6 P5 P4 P3 P2 P1 P0.Array Multiplier gives more power consumption as well as optimum number of Components required, but delay for this multiplier is larger. It also requires larger number of gates because of which area is also amplified; due to this array multiplier is less economical.

B. VEDIC MULTIPLIER

The Vedic mathematics is the very old system of mathematics which has a inimitable technique for fast calculations, based on 16 sutras. Vedic mathematics is part of four Vedas (books of wisdom). Which is an upa - veda (supplement) of Atharva Veda. It covers explanation of several modern mathematical terms including arithmetic, trigonometry, geometry (plane, coordinate), quadratic equations, factorization and even calculus. It was rediscovered in theearly twentieth century from ancient Indian sculptures (Vedas) by Sri B. K. Tirtha (1884-1960). Vedic Mathematics offers a simple and highly efficient approach to mathematics. Vedic Mathematics deals with numerous basic as well as complex mathematical operations.

3. URDHVA TIRYAKBHYAM SUTRA

The multiplier is based on an algorithm UrdhvaTiryakbhyam (Vertical & Crosswise) of ancient Indian Vedic Mathematics. "Urdhva" and "Tiryagbhyam" words are derivative from Sanskrit literature. Urdhva means "Vertically" and Tiryagbhyam means "crosswise". Anyone can easily realize that this Vedic method probably makes difference for mental calculations. If somebody tries to do multiplication mentally, in a conventional method, one would have to remember first row, then second row and likewise; then add all of them.
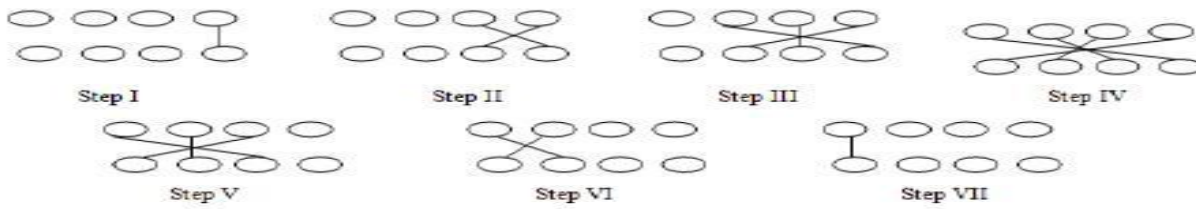
Method of Vedic Multiplier

The digits on the two ends of the line are multiplied and the product is added with the previous carry. When there are extra lines in one step, all the results are added to the previous carry. The least significant digit of the number acts as one of the result digits and the rest act as the carry for the next step. Initially the carry bit is taken to be as zero Vedic multiplier uses bit wise multiplication with simultaneous product term finding and it's column-wise addition.
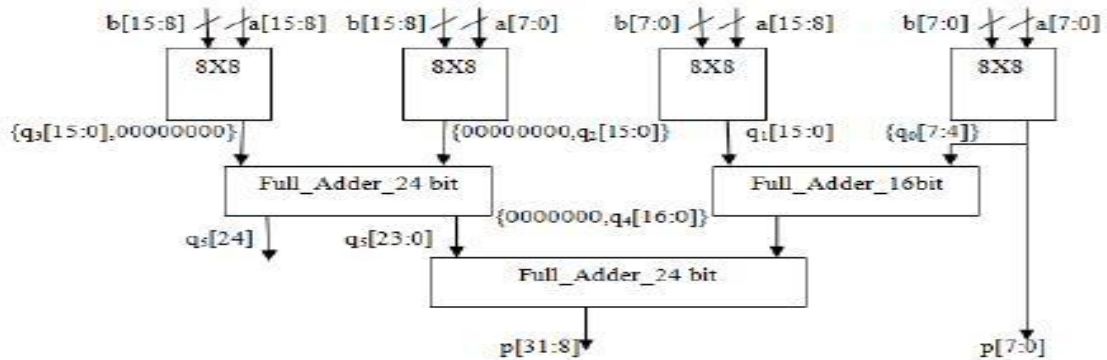
16x16 bit Vedic basic element

III.PROPOSED ARCHITECTURE
1.Vedic Multiplier

Proposed design uses only one carry save adder (CSA) instead of two, which results in reduced combinational path delay. The partial products are rearranged smartly so they can be added using one CSA. Using 8x8 a 16x16 multiplier has been designed which is used in 32x32 multiplier. The proposed architecture is shown in Fig
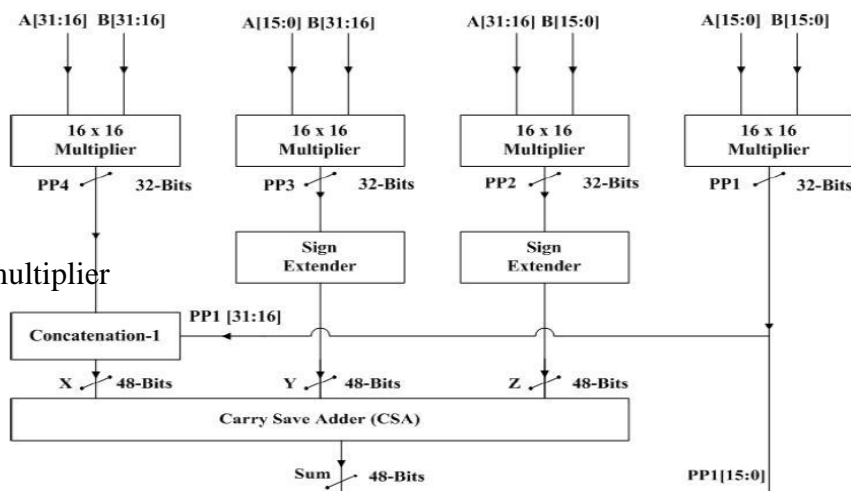

Figure 6 : 32 bit Vedic multiplier

there are two inputs A and B each 32-bit wide which are arranged into four blocks each of 16- bit: A[15:0], A[31:16], B[15:0], B[31:16]. These four blocks are multiplied with each other using 16x16 multipliers. The outputs of 16x16 multiplier's blocks are four partial products: PP1, PP2, PP3 and PP4. These partial products

are rearranged with most significant 16-bits of PP1 are concatenated with PP4 using concatenation-1 block while the least significant 16 bits of PP1[15:0] are directly fed to concatenation-2 block. The partial products PP2 and PP3 are extended to 48-bits using sign extenders. This result in three 48-bit operands: X, Y and Z which are added together using carry save adder block. CSA block uses two stage additions, at first stage parallel full adder's computes Sum1 and Carry1 using equation 1 and 2. At second stage in CSA, shift the Carry1 left by 1-bit and add it with Sum1 and gets the final Sum [9].The result of CSA is concatenated with the least significant 16-bits of PP1[15:0] using concatenation-2 block which finally yields a 64-bit final Product [63:0].

2. Array multiplier

In Array multiplier, almost identical calls array is used for generation of the bit-products and accumulation. All bit-products are generated in parallel and collected through an array of full adders or any other type of adders and final adder. Array multiplier has a regular structure that simplifies the wiring and the layout. Instead of using Ripple carry adder (RCA), here we use Carry look a head logic and Carry save adder for adding each group of partial product terms because RCA is slowest adder among all other fast adders available. Figure 2 & 3 shows architecture of 32-bit Array multiplier using CLA and CSA respectively to add each group of partial products in parallel.

Figure 7: 32-Bit Array Multiplier Using Carry save

Adder **IV. SYNTHESIS & SIMULATION**

simulation result of 16 bit array multiplier   simulation result of   32 bit array multiplier

simulation result of   32 bit vedic multiplier

simulation result of 32- bit array multiplier

V. COMPARATIVE ANALYSIS

Comparison b/w Vedic & Array multiplier for different bit length on Device-Spartan6

Bit length	Type	Delay(ns)	Levels of logic	No of slice LUTs	Memory(KB)
16	VEDIC	27.278	23	656	259076
	ARRAY	263.072	734	178	260868
32	VEDIC	31.526	29	2054	261455
	ARRAY	289.13	1034	208	262344

VI. CONCLUSION

From implementation, simulation & comparative results ,it is concluded that delay in Array multiplier is nearly ten times the Vedic multiplier, a better choice for fast application Higher the no. of look-up tables in Array multiplier reducing its packaging density i.e.. Also memory occupied by Array multiplier is relatively more than Vedic multiplier. Overall it can be said that the performance of Vedic multiplier is better than that of Array multiplier

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IoT Based Automatic Digital Toll Plaza Using RF Technology

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Abstract
This paper gives the idea about making Toll Plazas completely automatic.Here RF Technology merges wireless communication with unique identification method, in which every source RF Tag at vehicle emits its unique Identification Code (UIC) and then after receiving it, a receiver (at Toll Plaza) decrypts the signal and identifies the particular transmitter. Then this information about the source (vehicle) is displayed and Toll is deducted and stored for future use. But this system does not make toll collection completely automatic when there is need of recharging the user's account. Hence, in order to make toll collection system completely automatic and to avoid corruption at Toll Plazas some unique methods are suggested in this paper.

Keywords
Microcontroller, RF Tag, Transmitter Receiver, Motor Driver

I. INTRODUCTION

This paper is being designed to bring the RF technology (range limited wireless communication) in use that is widely used wireless communication system. It is used in different applications in different forms like security systems, attendance system, wireless control unit etc. In this system we are using this technology to make a wireless remote through which has inbuilt unique identity and can be used notify and define any person, object etc.

Today, we live in an age of wireless revolution where every effort is directed towards getting rid of wires. Removing wires not only makes things easy but also improves speed of operation. For example no one wants to stop at a toll tax and then mechanically deposit money rather there needs to be mechanism through which the car needn't be stopped and still the tax gets deposited. This will help in both achieving customer satisfaction as well as improving the efficiency of whole system.

Similarly identification of different things has also achieved new heights. It is very important to keep track of one's assets and hence unique identification has a major scope of development. This unique identification system will improve the overall efficiency of the system and will bring more social security. Through this

technology we can keep track of our pets, clothes, cars and various other things. This technology has application ranging from commercial purposes to even for an individual.

II. OVERVIEW AND PROBLEM STATEMENT

In existing manual Toll collection system there are several problem such as:

1. Due to corruption at Toll Plaza there is Financial Leakage.
2. Long queues of vehicle at Toll Plaza waste the fuel of vehicles.
3. Inaccuracy and delay in the system due to involvement of human nature.

Hence, this system is proposed in which there are three units:

Transmitter Unit: It consists of RF Tag which continuously emits radio frequency of 434 MHz, which is modulated signal indicating unique identification of user.

Receiver Unit: It consists of radio frequency Receiver which stores receives the transmitted signal, microcontrollerwhich is main driving part of this system, and LCD which displays the details of user account balance and unique id.

Motor Driving Unit: It consists of 12V servo motor. It is used to control the gate according to the command of microcontroller.

A. Literature Survey:

1. Existing Method

Present method is a manual method in which Toll Tax is collected by manually in form of cash.

But due to several inconveniences and disadvantages we have tried to propose a new method with several advancements.

Fig. 1: Existing Inconvenient Toll Tax Collection Method

2. Proposed Method

In our method we have used RF Technology to automate the Toll Tax Collection System, in which Toll Tax will be deduct from the user account as the vehicle moves from Toll Plaza and the Toll Gate will operate automatically with the command of microcontroller.
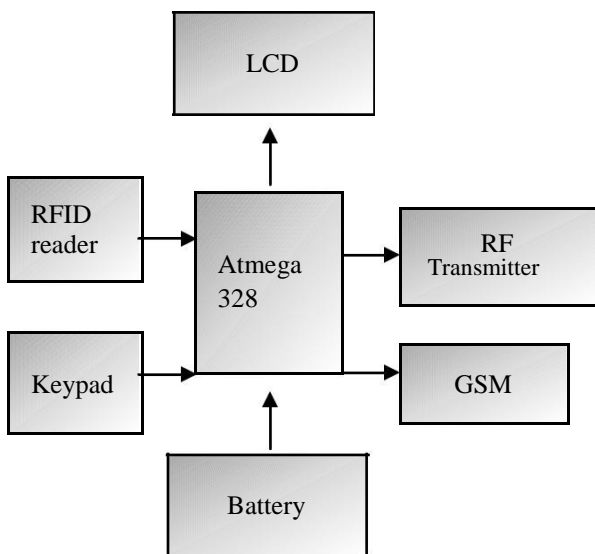
Fig. 2: Proposed Automatic System

A. Advantages of Proposed System

- Financial leakage control
- Fuel saving
- Reduced man power
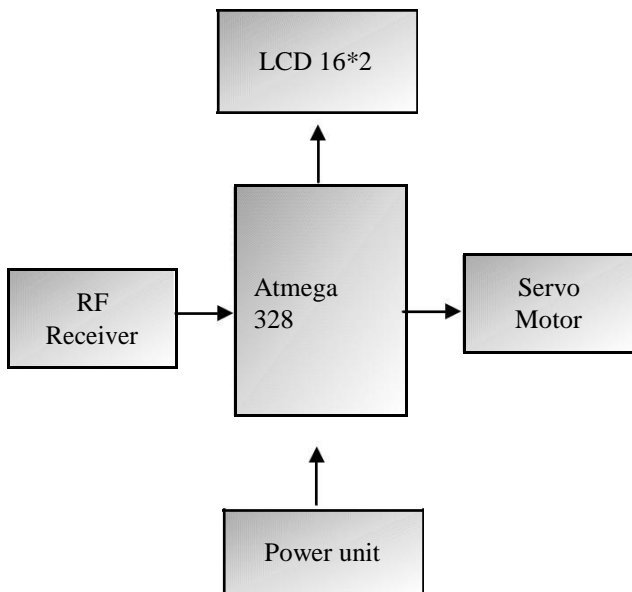- Reduced time for completion of process
- Cash free operation

B. Block Diagram
1. Transmitter(vehicle)

Block Diagram of Transmitter

2. Receiver(toll plaza)

Block Diagram of Receiver

3.Working of vehicle:

- In this system we have used RF technology to store the balance of each user.
- Each vehicle having its own RFID.
- Matrix 4*4(keypad) helps to choose one way or two way.
- LCD helps to display toll gate number.
- RFID tag to paid the toll tax with the help of swipe reader.
- Then Atmega 328 microcontroller performs data storage.
- IOT based RF transmitter is used to transmit the data.

4.Working of toll plaza:

- Vehicle id to be received by the RF receiver.
- Which is transferred to the microcontroller.
- Microcontroller also helps to details about vehicle stored into the database.
- Then gate section which opens or close automatically with the help of servomotor.
- In case person has not having money, then gate will not open.
- Whenever the user comes with his vehicle the RF receiver connected to the toll tax station, reads the RF tag which stores the vehicle number.
- The micro controller processes this code and checks the balance of that particular user
- If there is enough balance which is Rs50 over here he can go through the toll gate.
- The micro controller gives the command to the motor driver to rotate the motor in forward and backward direction to signify the opening and closing of the gate.
- If he does not have enough balance then the micro controller waits for the recharge button to be pressed.
- Thus the toll tax Automation system works.

5. Features

- RFID Tag cannot be cloned so cannot be cheated.
- Very efficient saving of time.
- Wastage of money reduced.
- Consumption of oil is reduced.
- Population is reduced to a large extent.
- Speedy Transport.
- Less congestion on roadways.

6. Some Possible Future Enhancements

(i). Account Number at Display:

Inclusion of bank account Number of user at display of LCD will facilitate activation of Net Banking in case of less balance in user's account. Where Registration number and Balance is already displayed on LCD screen
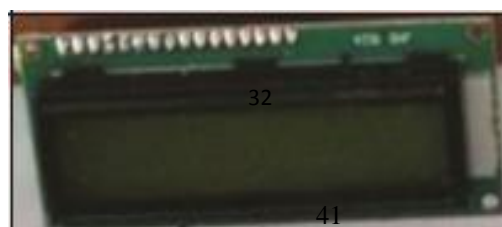
Fig. 8: Toll display on LCD
- Registration Number:
- Balance:
- Account no:

ii). Switching system in Tag
Since Tag transmits RF Waves continuously. Hence, Switching system at tag will reduce the power loss in Tag, and it will start transmit RF waves when user will switch it on at Toll Plaza.

(iii). Variation in Toll Tax according to the size of Vehicle
Arrangement can be made such that less Toll Tax will be deducted for the smaller and two wheeler vehicles and more Toll Tax will be deducted for larger four and multi wheeler vehicle by using two different sensors at Toll.
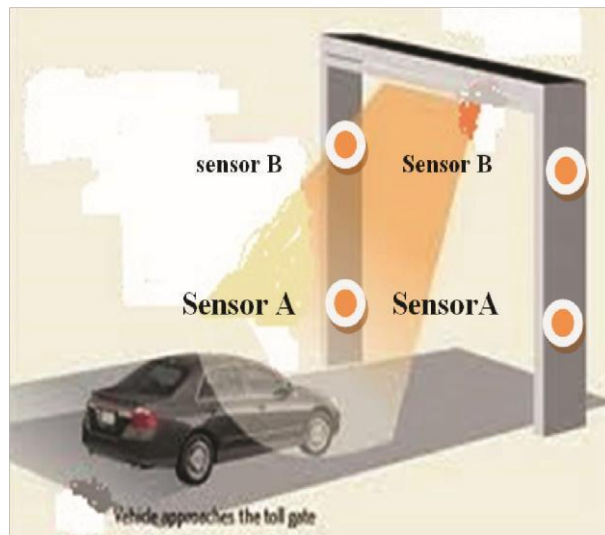
Fig. 9: Toll for Different Vehicles

For arrangement of sensors so that large and small vehicle can be identified is explained below:

Table 1: Truth Table for Gate vehicle detection

Output of Sensor 'A'	Output of Sensor 'B'	Detection through Toll Gate
0	0	0

0	1	x
1	0	S(Small vehicle is detected)
1	1	L(Large vehicle is detected)

On reducing above truth table using 2x2 k-map we get,

Reduced expression for detection through Gate = A (S+BL)

(iv). Integration of whole Toll Collection System

Here, All R F I D Tag contains the identification no. of vehicle, which are placed on moving vehicles have their unique identification number work as mobile system and they continuously transmit RF frequency By the time vehicle reaches the Toll Plaza transmitted signal by Tag is received by Receiver.

Receiver is located at Toll Plaza, which is connected to BTS, each Toll Plaza have its unique ID so, Toll Plaza transmits RFID id no. of vehicle tag along with its unique id no. to BTS and every BTS transmits RFID no. of vehicle, Toll Plaza id no. and its own identification no. to BSC and finally BSC transmits RFID no. of vehicle, Toll PLAZA id no., BSC id and its own id to main server i.e. MSC.

MSC stores the datasheets of all the vehicle users which contains vehicle RFID Tag no., its balance in account, and its account no. for automatic recharge of account, after receiving signal from BSC, MSC identifies vehicle, Toll Plaza, BTS ,BSC and type of vehicle by using above stated logic of small and large vehicle and after identification MSC deducts the amount of Toll Tax according to the size of vehicle and finally transmits updated balance of user account command to open the gate along with all the ids of BSC, BTS and Toll Plaza.

Information from the MSC is broadcasted to all the BSC but isreceived by the BSC whose id no. is matches with transmittedone, after receiving information from MSC,BCS broadcaststheuser's information, to all the BTS but is received by thatBTSwhose id is matched with transmitted one.

Now BTS transmits user's information to associated Toll Plaza &Toll Plaza transmits updated balance to vehicle and it is saved ontag and command to open the gate at gate module and finally gateopens, vehicle passes from Toll Gate and Gate closes.

In case of inefficient balance in user account then until it is notrecharged gate will not open, user's account is recharged by user'saccount no. automatically and further Toll deduction processcontinuous.
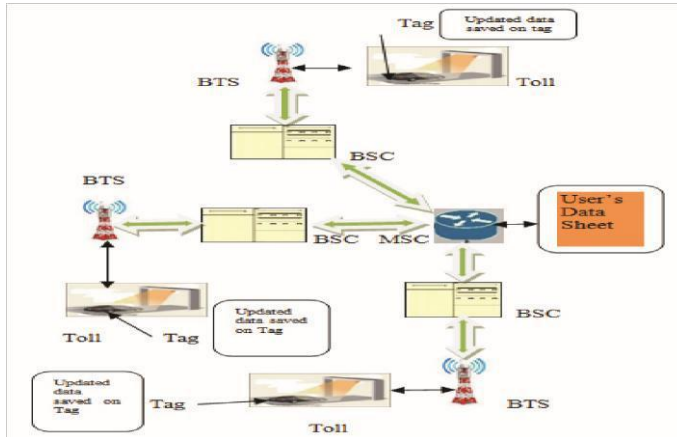
7. Toll payment limitations

To pay the toll amount the passenger has to have money in his account. If the passenger don't have sufficient amount of money in his account then he will be not entertained. Different vehicle will have different amount of payment. we can see the toll paying scale for different types of vehicle. As a prototype we are considering of two cases in our project. One case where the passenger has sufficient amount of money in his account to use the toll plaza and another is where the passenger don't have sufficient amount of money in his account to use the toll plaza. These two cases are given below in details.

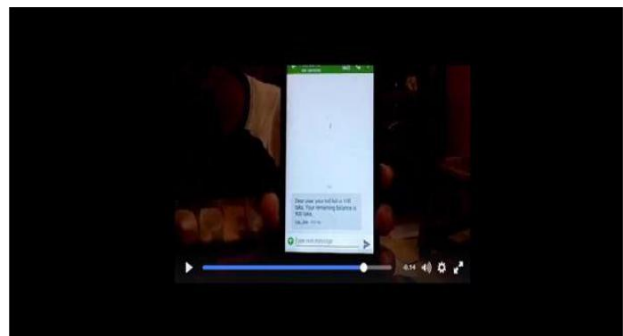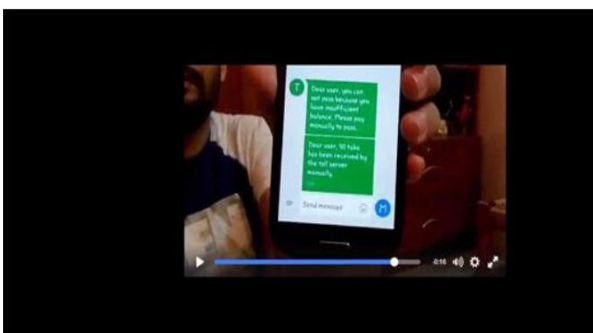| Different types of Vehicles	Toll Rate (TK)
Two-wheelers	10
Auto-rickshaw	18
Car	60
SUV	70
Microbus	85
Pick-up vans	130
Minibus	173
Bus	260
Small Trucks	173
Trucks	260
lorries	345

Different types of vehicle toll rate

Figure: SMS sending in mobile phone using GSM module

IV. CONCLUSION

IOT based Automation of Toll plaza using RF technology, we can have the best solution over money loss at toll plaza by reducing the man power required for collection of money and also can reduce the traffic indirectly resulting in reduction of time at toll plaza

With the elimination of human interaction in the entire toll collection process and also reduction of time at toll plaza, IOT module is useful the payment transcation at the online.

In our project we have introduced the techniques such as Radio Frequency Identification. This technique will include the RFID tag & reader which in coordination with each other can be used to detect the vehicle identity.

Byeffectively utilizing above three techniques at different stages of our system we are able to represent the automation in toll plaza which will reduce the complete processing time by few seconds which is very important as well as helps to reduce money leakage in a very cost effective manner.

V. FUTURE SCOPE

1. Vehicle theft detection
2. Signal breaking Avoidance
3. Tracking over Speedy Vehicle
4. Possible to keep track of our pets, cloths & cars

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Innovative Wireless Power Transfer System for Biomedical Capsule Endoscopy with Optimum Coil Configuration

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Abstract - Magnetic resonant-based wireless powertransfer system (WPTS) is an efficient way to energize critical biomedical devices such as wireless capsule endoscope where a direct wire connection is not practical. However, low power transfer efficiency (PTE) and poor received power stability (RPS) are usually the main bottlenecks of WPTS in this application. Thus, this paper proposes an efficient WPTS that tremendously improves the PTE and enriches the RPS. In order to improve the PTE, an optimum 3-coil inductive link is adopted with a compact wearable power transmitting coil-I (PTC-I) and a 2-3D power receiving coil. Whereas, the stability is improved with new configuration of power transmission coil-III (PTC-III) and power combining technique at the receiving side. To confirm the validity of the proposed design, proof-of-concept prototypes were implemented for experimental test. Results obtained from the experimental test assured that the proposed PTC-I based system achieved a PTE of more than 8% while transferring 758 mW of power with 68.7% RPS. Whereas, the best overall RPS attained by the proposed PTC-III based system is 79.2%. This system achieved a PTE of 5.4% transferring at least 570 mW of power. In comparison, the performance of the proposed designs greatly outweighs the previous designs.

Index Terms - **Inductive power transfer, multi-coilinductive link, received power stability, wireless power transfer, and wireless capsule endoscopy.**

I.INTRODUCTION

Wireless power transfer system (WPTS) has received increasing attention to address power limitations typically encountered by implantable biomedical devices such as wireless capsule endoscope (WCE) [1-3].The system consists of a power transmitting coil (PTC) positioned outside of the patient body and a tiny power receiving coil (PRC) with rectifier and regulator circuit embedded within the WCE. The WCE with PRC is freely moving inside the patient gastrointestinal (GI) track.
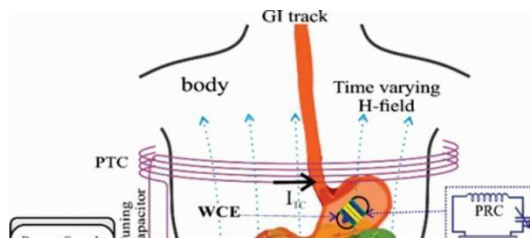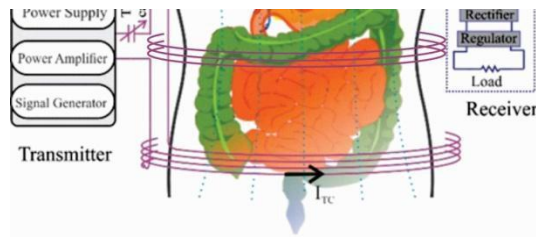
Fig. 1. A schematic of magnetic resonance based wireless power transfer

Based on the literature, the 4-coils based system attains relatively higher inductive link efficiency [8] when source and load resistance are largely differed from the internal resistance of PTC and PRC, respectively. However, this investigation is performed with a small size of coil set (∅ 6.4 – 2.2 cm) to transfer small amount of power in short distance (~100 mW in 2 cm). An analysis by [22] with a medium size of coil set (∅ 16.8-10.5 cm) indicated that the 4-coils based inductive link failed to attain high power delivery to the load (PDL) though it attained high efficiency. Thus, the study in [22] proposed a 3-coils inductive link to obtain high PDL. However, the 4-coil or 3-coil based indicative link has not been completely analyzed for a large coil set (around ∅ 40 cm) in transmitting side and tiny coil (around ∅1 cm) in receiving side which are deployed in WCE application for PDL above 300 mW.

Although, a 4-coil based magnetic resonant WPTS was presented in [16] for biomedical WCE application, nonetheless, the obtained low PTE 0.02% indicated further investigation on multi-coil WPTS in WCE platform is still required. Thus, this paper investigates and presents an efficient wearable WPTS with an optimum 3-coil inductive link, new coil configurations of PTC and power combining configuration of PRC for WCE application. This paper also discusses a comprehensive analysis on RPS in terms of position and orientation stability. The original contributions of this paper include: i) improvement of PTE by 69.55%, ii) improvement of RPS 133.6%, iii) improvement of system portability by compact wearable PTC, and iv) introducing fine tune driving circuit.

This paper is organized as follows: Section II formulates the design method and analysis of 3-coil inductive link, new coil configurations, and power combining technique in the PRC. Section III describes the implementation of a proof-of-concept prototypes, their measured specifications, and experimental setup. Experimental results, discussion, and comparison of the Obtained results with other works are presented in Section IV.

Finally, concluding remarks are given in Section V.

II. METHODS AND MATERIALS

A. Overview of multi-coil inductive power link in WCE platform

In order to analyze the link efficiency (η) of multi-coils inductive WPT link in WCE platform, a 4-coil resonant inductive link is used. A simplified schematic and lumped element model of the 4-coil based resonant inductive link is shown in Fig. 2 for analysis. This 4-coil based link uses two additional coils with the conventional 2-coil based link. The additional coils are named as driving coil (coil 1) and load coil (coil 4) deployed in the transmitting and the receiving sides, respectively. These additional coils are used to minimize the effect of source and load resistance to the loaded quality factor PTC and PRC, respectively.

(a)

(b)
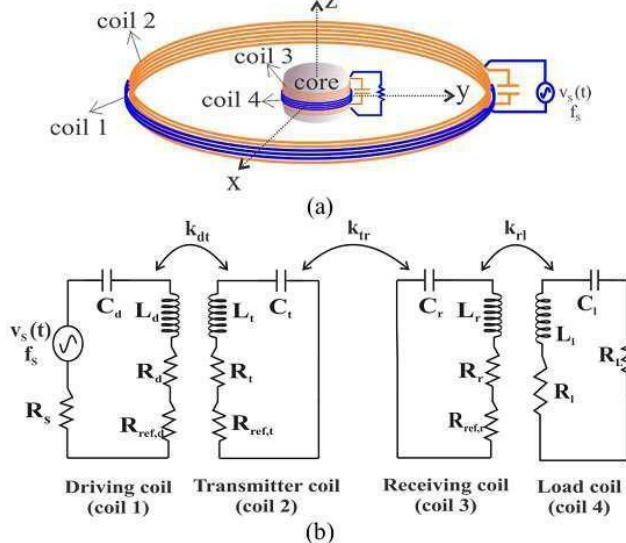
For the loaded Q_L, the efficiency of 2-coil (transmitting and receiving coils), 3-coil (transmitting, receiving, and load coils), and 4-coil (driving, transmitting, receiving, and load coils) based inductive link of Fig. 2 can be given by (3), (4), and (5), respectively [22, 23]. Based on the above relations, the simulated η of the inductive links due to different number of optimum coils for WCE application are shown in Fig. 3. It can be seen from the Fig. 3 that the 3-coil based inductive link has attained the highest efficiency which is slightly higher than that of 4-coil based system. In comparison to the 2-coil system, the load coil of the 3 -coil system compensates the effect of load resistance on the loaded quality factor of the receiving coil. In the 3-coil based system, the load resistance is not directly connected to the receiving coil therefore this allows the receiving coil to have higher quality factor which compensates the weak coupling between the transmitting coil and the receiving coil (k_{tr}) and helps to improve the efficiency. Similarly, the driving coil in 4-coil system could be advantageous for the system that is derived with a source having high resistance (around $RS = 50$). Since, PTC is driven by a driving amplifier having low output resistance, thus RS can be considered low and there will be less effect on the loaded quality factor of PTC. Therefore, the 4-coil based system is not advantageous over the 3-coil system in this particular application with such a large size of PTC. In addition, the large dimension and high quality factor of the transmitting coil result relatively high reflected resistance at the driving coil as well as low loaded quality factor. Thus, in this application platform, the 4-coil based system fails to attain higher efficiency. For all the cases, the η increases along the y-axial distance because with the receiving coil approaches to the transmitting coil with increasing the y-axial until the receiving coil gets out of the transmitting coil.

B. PTC Configuration

The main goals of PTC configuration are to obtain the highest possible: i) quality factor, ii) coupling coefficient, and

iii) magnetic field (H-field) uniformity. The quality factor and coupling coefficient help to improve the η while the uniform H-field is important to improve the RPS and to minimize thepeak electromagnetic exposure of patient body tissues.

To meet these goals, most of the existing studies use typical Helmholtz coil (THC) [3, 13, 14] as shown in Fig. 4a. However, the quality factor and coupling characteristics of THC have not been properly analyzed in the previous studies. Detailed analysis and comparisons on these two parameters of THC along with other conventional coils have been perform [15], where a new configuration of PTC namely improved the power transferring efficiency.
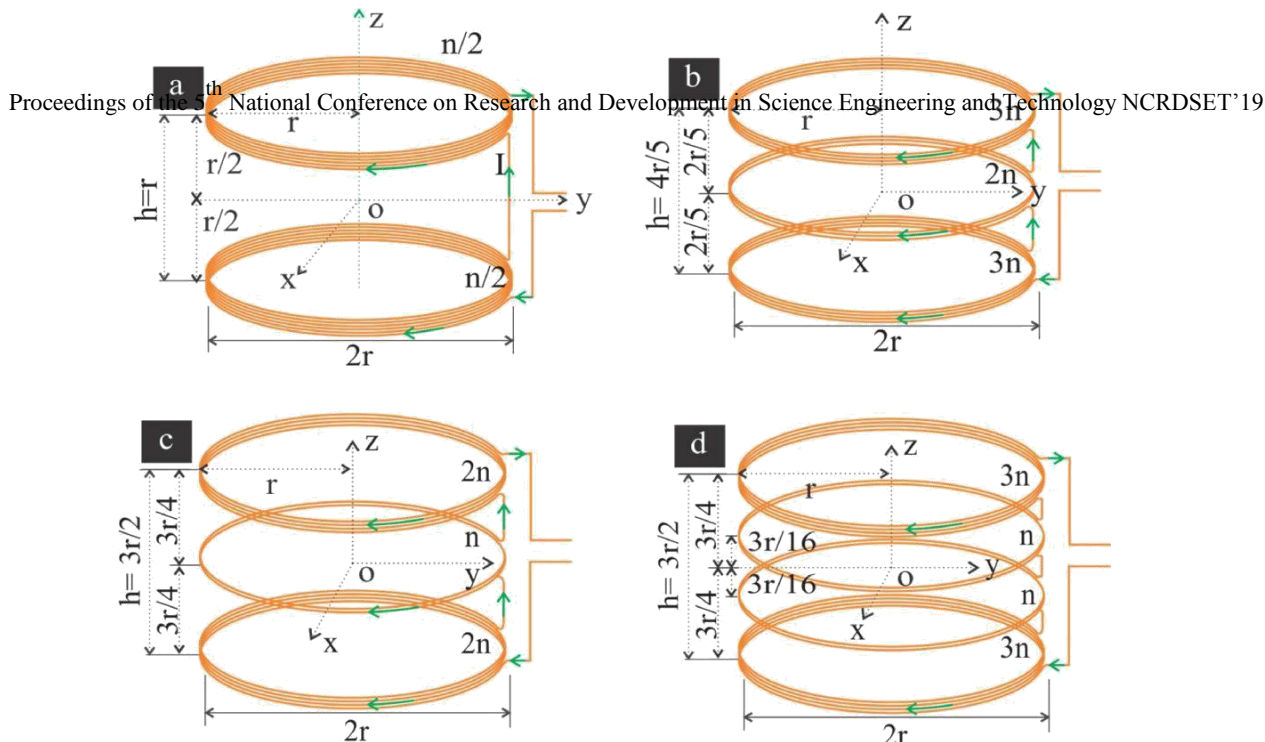
Fig. 4. A 3D schematic view of power transmission coils: (a) THC; (b) PTC-I; (c) PTC-II; and (d) PTC-III.

III. IMPLEMENTATION OF PROPOSED SYSTEM

Based on the design and analysis performed in the previous section, the implementation of resonant inductive wireless power transfer system with new coil configurations and power combining technique is presented in this section. The demonstrated implementation features compact wearable PTC, miniaturized 2-3D power combining receiver, and PTC driver with excellent tunability. The specifications of the proposed system are summarized in Table I.

A. Compact Wearable PTC

Design constraints of PTC for a targeted application in the WCE are usually limited level of H-field uniformity, bulky size, and low coupling with the PRC. Two new configurations of PTC are employed rather than the typical solenoid or Helmholtz coil. The new configurations allow implementation of the PTC making compact size in wearable form due to its higher H-field uniformity. The compact size and new configuration also improve the coupling. Thus, two PTCs, PTC-I and PTC-III are implemented based on the performance. The implemented wearable PTC-I and PTC-III are shown in Fig. 11. These PTCs have been implemented with textile where a diameter of 35 cm was chosen to be adjusted with a free size mannequin. This diameter can be adjusted with different patient group, though, the larger diameter causes slightly lower PTE. Two wearable waist belts having equal length of 115 cm, thickness of 3.5 cm are prepared to fix the PTC to the patient body.
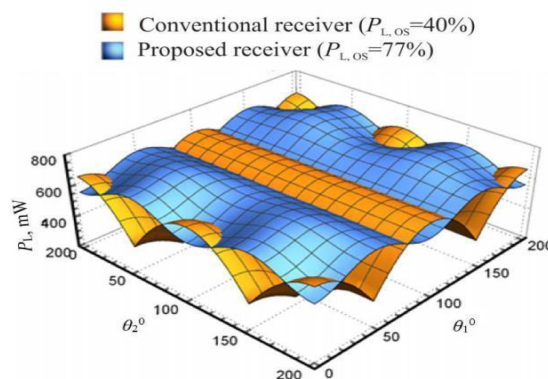
B. *Miniaturized 2-3D power combining receiver*

The implemented power receiver unit is illustrated in Fig.

Initially, the PRC is implemented in 1D form with receiving and load coils, L_{rx} and L_{lx}, respectively as shown in Fig. 12a. In order to cope with the misalignment problem, the 1D coil has been converted to 3D PRC which is shown in Fig. 12b. This 3D PRC consists of two sets of three orthogonal coils aligned in *x*, *y*, and *z*-direction. One set is receiving coil and the other set is load coil, therefore, we named it as 2-3D PRC. The electrical specifications of this implemented 2-3D PRC are shown in Table I. In the PRC set it is important to have identical properties of each of the coils in *x*, *y*, and *z*-direction to ensure an equal amount of received power by the individual coil for a common alignment, thus improves the orientation stability. Therefore, the coils need to be carefully implemented to obtain equal specification for all the coils. As it can be seen from the Table I, the implemented *x*, *y*, and *z* coils have almost similar specification of inductance, resistance and quality factors. The selection of a number of turns and strands of Litz wire in the receiving coils are selected for high Q_r. Whereas, the selection of number of turns in the load coil needs to be optimized for optimal Q_l of load coil and coupling k_{rl}. The high Q_l and k_{rl} cause high reflected impedance at the receiving coil that decreases the loaded $Q_{r,L}$ of receiving coil and power transfer efficiency. On the other hand, low k_{rl} causes the low efficiency between the receiving and load coils as well as in the overall link. Taking account of this effect an optimal number of 3 turns was used for the load coil. The final shape of implemented 2-3D PRC was a cubicwith the average diameter of 12 ±0.1 mm. This size of the PRC is small enough to fit in any existing commercial capsule with the length of 27.9 mm and diameter of 13 mm [25].
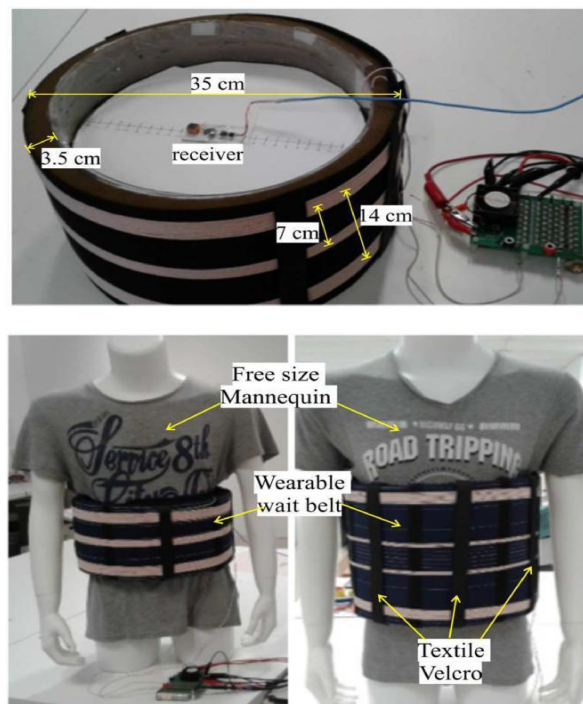

Fig. 11. (a) Experimental prototype for measurement of power and efficiency, (b) PTC-I, and (c) PTC-III set with free size mannequin.

C. PTC driver with excellent tunability

In order to drive the PTC, a class E driver was implemented with excellent tuning capability. The class E driving topology is widely used due to its advantage in size, cost, and efficiency [26, 27]. The conventional topology of class E driver is modified as in Fig. 13a to enable the driver's fine tuning capability to versatile design of PTC that can operate at different frequencies. A series parallel capacitor bank is used so that the driver can tune different TPCs and it can cope with high voltage that appears across the PTC having high quality factor. In order to allow fine tuning, a high oltage variable capacitor SGNMNC31006 (supplied by Sprague-Goodman Electronics) is used in parallel with the main capacitor bank as shown in Fig. 13a. This mode of variable capacitor is chosen for its high voltage rating (~6 kV) that easily can cope with the voltage raise across the high Q power transmitting coil. The size of this variable capacitor is compatible with a 10 cm x 10 cm PCB board used for implementation of class E driver as shown in Fig. 13b. The variable capacitor itself allows fine tuning within the range of 10-100 pF. The variable capacitor and series parallel capacitor bank together provides overall tuning within the range of 10pF to 2162.5 pF with less than 1pF tuning step.

IV. RESULTS AND DISCUSSION

The performance of the implemented WPTSs has been tested acquiring the received power by measuring voltage (V_L) of the load resistance, R_L, which was connected to the receiving circuit as shown in Fig. 9b. The load resistance was set to 30 , approximating the average load of robotic capsule endoscopy [17]. The WPTS was perfectly tuned at 250 kHz. The measured VL was converted to the received power (PL) and PTE was calculated as follows

system are lower than that of PTC-I based system, nonetheless, the P_L was much stable over the position. Based on the calculation
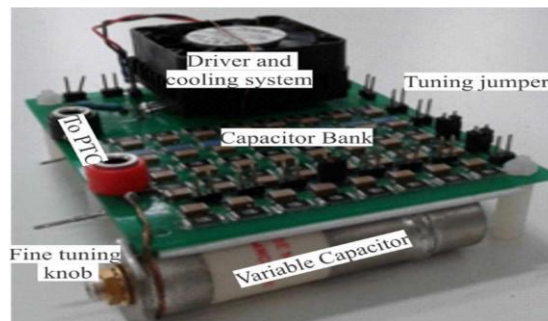

Fig. 13. Class E driver with improved tuning circuit

The overall performance of the proposed WPTSs has also been compared with the other WPTSs for WCE in Table II and Table III. To make a fair comparison, for each case, the PL and the PTE are taken when the PRC was located at the center of the PTC. The RPS has been compared with only one of the other studies [13]. To the best of our search, only this study fully analyzed the RPS. As it can be seen from the comparison in Table II and Table III, the proposed system tremendously improved the PTE and RPS. This improvement could be attained by the new coil configuration of PTC, compact size of PTC, optimum 3-coils link, 2-3D PRC and power combining technique.

V CONCLUSION:

A new wearable power transfer wireless power transfer system has been presented for wireless capsule endoscopy application. A 3-coil inductive wireless power transfer system with wearable power transferring coil and 2D power receiving coil are utilized to increase the power efficiency of the proposed

system. The analysis and experimental results of the proposed system shown that the proposed system tremendously increase the efficiency and RPS The PTC-I based wearable system attained the best power transfer efficiency which was around 8.21% when at least 758 mW power was transferred. This system attained the overall received power stability of 68.7%, while the PTC-III based system obtained the best received power stability which was around 79.2%. This system attained the power transfer efficiency of 5.4% when at least 570 mW of power was transferred.

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High Speed Dynamic Share Link between Mobile Terminals using Visible Light Communication

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Abstract - Visible Light Communication (VLC) has a promising future and it acts as a omplement to the present RF communication by achieving larger bandwidth and high data rate. Eco-friendly data communication through visible light consists of the white LEDs that transmit data signals to the receiver. The receiver circuit consists of laptop to display the received data. In recent years, there is a rapid development in the solid state light-emitting diode (LED) materials which gave way for the next generation data communication known as visible light communication. Hence, this project presents about ecofriendly data communication through visible light which consists of the white LEDs that transmit data signals to the receiver. The receiver circuit having pc to display the received data. Here we are using LIFI transmitter and receiver modules to send and receive data and then we are using arduinouno at the transmitter and receiver side for synchronization and processing data and encoding. The transmitter section consists of arrays of LED's so that we can improve the baud rate and speed of serial communication.

Keyword - Visible light communication (VLC), Light Emitting Diode, Photo diode.

I. INTRODUCTION

Visible light communications technology uses visible light (380-780 nm) to deliver information without the effects of electromagnetic waves, keeping pace with current wireless communications.

There are around 1.4 million cellular mast radio waves base stations deployed, with over 5 billion mobile phones. Mobile phones transmit over 600TB of data. Presently wireless communication uses radio waves. Spectrum is the one of the mostessential requirement for wireless communication. With the advancement in technology and the number of users, the existing radio wave spectrum fails to cater to this need. To resolve the issues of scalability, availability and security, we have come up with the concept of transmitting data wirelessly through light using LEDs, which is called as Li-Fi is a latest technology that makes use of

LED light which helps in the transmission of data much faster and flexible than data that can be transmitted through Wi-Fi.

LED lights are becoming widely used for homes and offices for their luminous efficacy improvement. Visible light communication (VLC) is a new way of wireless communication using visible light.
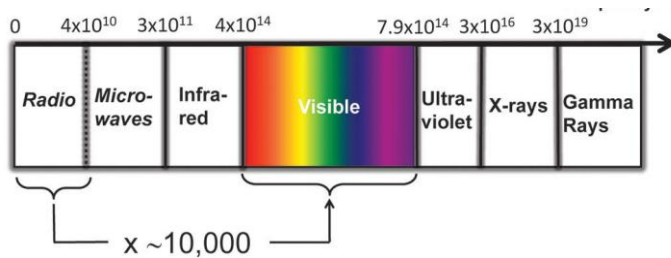

Figure 1.The electromagnetic spectrum and the vast potential of unused, unregulated, safe green spectrum in the visible light part. The visible light spectrum is 10,000 times larger than the entire radiofrequency spectrum.

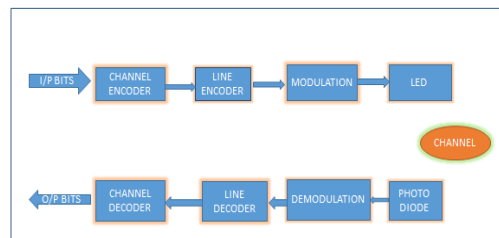## II. BLOCK DIAGRAM OF VISIBLE LIGHT COMMUNICATION

Figure 2.Typical Physical Layer System Model Of VLC.

III.TRANSMITTER

White LED

White LED light can be generated by different operating principles. The main operating principles are the RGB principle and the phosphor principle.

White LED light – using the RGB principle

The RGB principle uses the combination of a red, green and a blue LED. The light of the three EDs is mixed using optics. This operating principle of making white light is however problematic as color shift caused by temperature and LED aging is hard to control.

White LED light – using the phosphor principle

IV.RECEIVER

Photo detector

A photodiode is a kind of light detector, which involves the conversion of light into voltage or current, based on the mode of operation of the device. It consists of built-in lenses and optical filters, and has small or large surface areas. With an increase in their surface areas, photodiodes have a slower response time. Conventional solar cells, used for generating electric solar power, are a typical photodiode with a large surface area. A photodiode is a semi-conductor device, with a p-n junction and an intrinsic layer between p and n layers. It produces photocurrent by generating electron-hole pairs, due to the absorption of light in the intrinsic or depletion region.The photocurrent thus generated is proportional to the absorbed light intensity. When photons of energy greater than 1.1 eV hit the diode, electron-hole pairs are created. The intensity of photon absorption depends on the energy of photons – the lower the energy of photons, the deeper the absorption is. This process is known as the inner photoelectric effect. If the absorption occurs in the depletion region of the p-n junction, these hole pairs are swept from the junction - due to the built-in electric field of the depletion region.

V. MODULATION SCHEMES

1. On-Off Keying (OOK): The 802.15.7 standard uses Manchester coding so that the period of positive pulses is same as the period of negative ones, however this doubles the bandwidth required for transmission. For higher bit rates, run length limited (RLL) coding is used which is spectrally more efficient. Dimming is supported by adding an OOK extension which adjusts the aggregate output to the correct level.

2. Variable Pulse Position Modulation (VPPM): PPM encodes the data using the position of the pulse within a set time period .The duration of the period containing the pulse must be long enough to allow different positions to be identified. VPPM is similar to PPM but it allows the pulse width to be controlled to support light dimming.

3. Color Shift Keying (CSK): This is used if the illumination system uses RGB-type LEDs. By combining different colors of light, the output data can be carried by the color itself and hence the intensity of the output can be near constant. Mixing of RGB primary sources produces different colors which are coded as information bits. The disadvantage is that it increases the complexity of the transceivers.

4. Sub-Carrier Inverse PPM (SCIPPM): This method is divided into two parts (1) sub-carrier part and (2) DC part. The DC part is used only for lighting or indicating. When there is no requirement for lighting or indicating, SCPPM (Sub-Carrier PPM) is used in order to save energy.

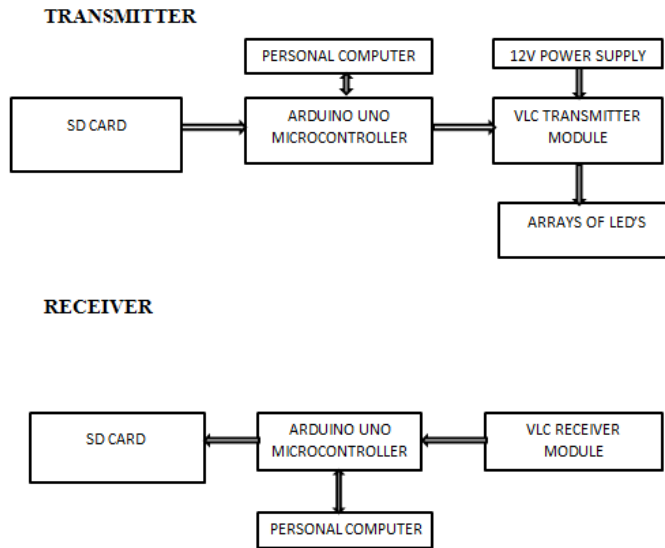## VI.PRACTICAL IMPLEMENTATION OF VLC USING ARDUINO UNO

Figure 4.Design of Transmitter and Receiver

Communication system components are:

1. A high brightness white LED which act as a communication source.

2. Silicon photo diode which shows good response to visible wavelength region. LED illumination can be used as a communication source by modulating the LED light with the data signal. The LED light appears to be continuous to the human eye due to the fast flickering rate.

The high data rate can be achieved by using a high speed LED's and appropriate multiplexing technique. Each LED transmits at different data rate which can be increased by parallel data transmission using LED arrays

VII.VLC TRANSMITTER AND RECEIVER

Li-Fi TX side

The TX side will transmit the data.

It is connected to arrays of led through which data is transferred.

This data will be received by the receiving side (Rx) side.

Li-Fi Rx side

The receiver side will receive the data that is transmitted through the led pa

This led can be displayed to the HyperTerminal of the Pc by connecting a serial UART
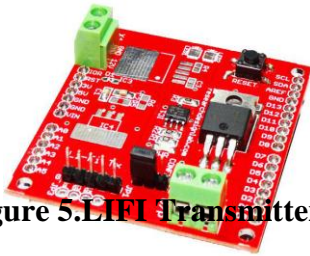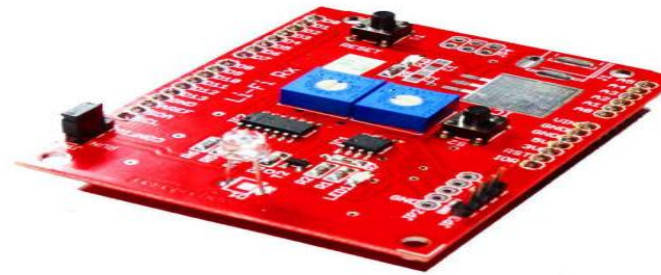
Figure 5.LIFI Transmitter Module

Figure 6.Lifi Receiver Module

Figure 7.Experimental Setup

Features

- Transmit data serially at 38400 baud rate
- Distance of 1 foot to 10 feet can be achieved
- Low power requirement
- No effect on human health
- Highly secure compared to Wi-Fi
- High data density because visible light can be well contained

VIII.RESULT AND DISCUSSION

The outcome of the experiment shows some problems which can affect the reliable transfer of data. Below are the problems and proposed solutions:-

PROBLEMS:

1. High current can damage the LED's and it leads to the fail use of the efficiently and reliability of transferring data.

2. Sunlight and other powerful light sources can interfere with the response of the photodiode.

3. It is a direct line of sight communication so obstacles can affect the transmission of data.

4. Distances between the transmitter and receiver is limited.

PROPOSED SOLUTIONS:

1. The problem of LED,s damage can be solved by using voltage regulator IC7812 which safeguard the circuit from voltage fluctuations and high current.

2. To avoid interference from other light sources we should power off the unwanted light sources and the setup should be kept at a environment where light intensity is less.

3. The distance between LED array and photo diode should be adjusted prior to run mode in config mode to achieve maximum efficiency.

4. The setup should be carefully observed while ongoing transfer for any obstacles between transmitter and receiver

X.RESULT

We achieved a baud rate of 38400 and successfully transferred a text file from one SD card to another.
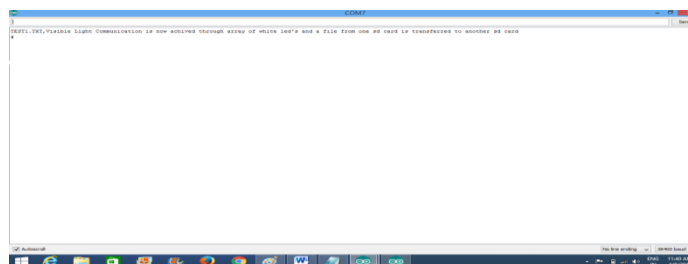

Figure 8.Transmitted Data Monitoring

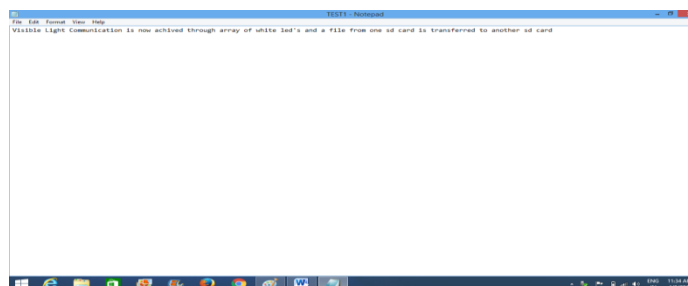**Figure 9.Received Data Monitoring**

Figure 10.Received Text Documen

XI. CONCLUSION

Data communication through visible light consists of the white LEDs that transmit data signals to the receiver has been implemented. The receiver circuit consists of laptop to display the received data. With the growing technology and increasing us of the internet services, possibilities are very high that use of Li-Fi technology will be soon in practice. Every bulb will be replaced by Li-Fi bulbs and might be used like a Wi-Fi hotspot for the transmission of data. Using Li-Fi technology will grant a cleaner, greener and brighter future and environment. The concept of Li-Fi is spreading so fast as it is easy to use, it is attracting interest of people. The use of Li-Fi technology gives a very golden opportunity to replace or to give alternative to the radio based wireless technologies. As the number of people and the access of internet are increasing on such a large scale, accessing internet through Wi-Fi will soon be insufficient as the usage is increasing but the bandwidth remains the same. As network traffic will increase it will result in lowering the speed of accessing the internet thus more increasing prices.

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Segregation of waste using IoT

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Abstract - In present scenario efficient waste management is the major objective of the country. Segregation of waste and creating awareness of different types of waste is new boom. Waste from the houses can be broadly divided into two categories dry waste and wet waste. It is recommended to have two separate dustbins in the house to keep wet waste from mixing up with its dry counterpart. Due to lack of awareness in citizens they prefer mix all the waste and disposed. It is just loss to ecosystem as well as individual health due to poisonous gas emission from waste. Bad smell spreads and may cause illness to human beings. It also leads to unhygienic environment and look of the city. In this proposed system smart dustbin will be created in which soil moisture sensor sense the moisture of waste and based on threshold value desired one will be enter as input. To achieve the overall scenario IOT technology will be used.

1. INTRODUCTION

In this world of Wi-Fi and 4G, the new wave of modern technology is Internet of Things commonly called as IOT. The real goal is to use every object as a part of the network, and not just embedding intelligence in smart phones and laptops. Sensor network technology play key role in IOT based devices. Most people think that accumulation of waste starts once the garbage reaches the huge dustbin vans or the dumping grounds but in actual it starts right at your house. These smart bins will lead to proper waste management. In our system, idea is suggested where we can create dustbins that will accept the waste in segregate form only. The idea is to place two dustbins of different color at every street one for wet waste and one for dry waste. So even if it doesn't get segregate at individual level it can be done at street level. Both the dustbins are interfaced with micro controller base system and soil moisture sensors of certain numbers. This system is interfaced with LCD to observe the results. The data has been received, analyzed and processed, which displays the status of the Garbage which one is trying to feed, if found right then will accept it otherwise not.

2. METHODOLOGY

The methodology for the proposed solution has been developed. The idea is to use sensors not just for level indication, but also for sensing state of matter of waste being disposed. Our system suggests that used two bins one for solid waste and one for liquid waste collection. Solid waste predominantly, is any garbage refuse or rubbish that we make in our homes and other places. These include old car tires, old newspapers, broken furniture and plastics, paper, rubber, metals, leather, cloth rags, wire, glass and things etc. fall under the category of dry waste. Wet waste includes cooked and uncooked food, waste from fruits and flowers, fallen leaves, dust from sweeping and other eatable items.

The principle is every object will have certain amount of moisture. Sensor will calculate the moisture of every object (waste). Decide certain threshold value to differ solid waste from liquid waste. Say if threshold value is set to 10% for solid waste collection bin and more than this will be considered as liquid waste. Calculate the moisture level of all the waste input. Now that moisture content is calculated using all thEvery sensor will have value of flag as zero and one. If the moisture content will be less than or equal to 10% then flag will give the value of one. If moisture content exceeds 10% then flag will give the value of zero. The value of all the sensors is observed. If flag value of one is more than waste will be input to solid waste bin else it will be input in liquid waste bin. The dustbin should have two levels. Top level will perform this calculation and if find right then certain slider which will dispose the waste to bottom. If the waste found to be input in wrong bin then it will throw it out in certain bowl. From that bowl one should disposed the waste in proper bin to be accepted. Micro-controllers will used to receive data from sensor. Micro-controllers processed data that data is processed and can be viewed on LCD. Though completely not achieved but yet the new start to segregation of waste can be observed. The amount of recyclable waste will surely be in more much amount as compare to current scenario. After that IR sensor will sense data once bins level gets complete. The bins will be emptied and can be tracked using WIFI and RFID technology. SystEvery sensor will have value of flag as zero and one. If the moisture content will be less than or equal to 10% then flag will give the value of one. If moisture content exceeds 10% then flag will give the value of zero. The value of all the sensors is observed. If flag value of one is more than waste will be input to solid waste bin else it will be input in liquid waste bin. The dustbin should have two levels. Top level will perform this calculation and if find right then certain slider which will dispose the waste to bottom. If the waste found to be input in wrong bin then it will throw it out in certain bowl. From that bowl one should disposed the waste in proper bin to be accepted. Micro-controllers will used to receive data from sensor. Micro-controllers processed data that data is processed and can be viewed on LCD. Though completely not achieved but yet the new start to segregation of waste can be observed. The amount of recyclable waste will surely be in more much amount as compare to current scenario. After that IR sensor will sense data once bins level gets complete. The bins will be emptied and can be tracked using WIFI and RFID technology. System Architecture.
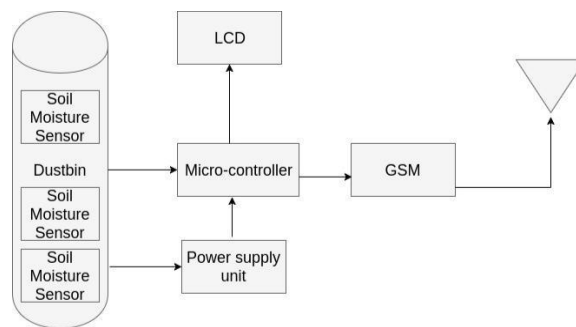
Arduino DuemilanoveThe Arduino Duemilanove ("2009") is a micro-controller board based on the ATmega168 or ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains

everything needed to support the micro-controller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

Soil Moisture Sensor The soil moisture sensor is used to measure volumetric water content of soil. The soil moisture sensor uses capacitance to measure the water content of the soil. This moisture sensor will be used to measure the moisture content of waste. Range: 0 to 45% volumetric water content in soil (capable of 0 to 100% VWC with alternate calibration).Accuracy: ±4% typical. Typical Resolution: 0.1%.Power: 3mA @ 5VDC. Operating temperature:–40°C to +60°C. Dimensions 8.9×1.8 cm×0.7 cm.

IV. ALGORITHM AND FLOWCHART OF PROPOSED MODEL

ALGORITHM:

Step 1: Start the experiment by taking two dustbins.

Step 2: Dispose the mix waste in bin.

Step 3: Calculate the moisture content.

Step 4: According to certain threshold if moisture content comes out to be greater than threshold in that case opens the liquid waste bin.

Step 5: If moisture content comes out to be less than dispose that waste out and store it in solid bin.

Step 6: Close the experiment. The threshold value can be decided by iterative process. In our case we repeat the process and it is set as 10%. Test cases and Results: 1) Dustbin moisture content – 0-10% (input in solid waste bin) 2) Dustbin moisture content – 10% (input in solid waste bin) 3) Dustbin moisture content – more than 5% (input in liquid waste bin)
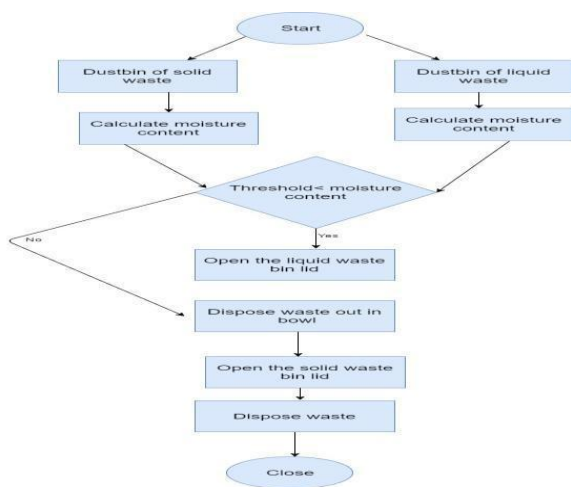
Advantages of Proposed System

• Real time information on the state of the dustbin.

• Deployment of dustbin based on the actual needs.

• Cost Reduction and resource optimization.

• Improves Environment quality

-Fewer smells -Cleaner cities

• Intelligent management of service in the cities.

V. CONCLUSION

This scenario will help the waste managers to recycle the waste in more appropriate way. To make it even better the power supply can be used using solar panels. These system can be implemented in waste bins which are placed in colony as well as huge places where dump yard are present, main motive is waste should be segregated. In one research it has been found that if waste of India will be recycled properly then it can be capable of giving country money in millions instead of investing money. With this the dream of developed India can be seen actually.

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A Assorted Novel-Discriminative Based Hashing Method

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Abstract— this paper represents the hashing method. Hashing methods have proven to be useful for a variety of tasks and have attracted extensive attention in recent years. Various hashing approaches have been proposed to capture similarities between textual, visual, and cross-media information. However, most of the existing works use a bag-of-words method to represent textual information. Since words with different forms may have similar meaning, semantic level text similarities cannot be well processed in these methods. To address these challenges, in this paper, we propose a novel method called semantic cross-media hashing (SCMH), which uses continuous word representations to capture the textual similarity at the semantic level and use a deep belief network (DBN) to construct the correlation between different modalities. To demonstrate the effectiveness of the proposed method, we evaluate the proposed method on three commonly used cross-media data sets are used in this work. Experimental results show that the proposed method achieves significantly better performance than state-of-the-art approaches. Moreover, the efficiency of the proposed method is comparable to or better than that of some other hashing methods.

I. INTRODUCTION

Due to the rapid expansion of mobile networks and social media sites, information input through multiple channels has also attracted increasing attention. The relevant data from different modalities usually have semantic correlations. For example, images can be used to find semantically relevant textual information. Existing methods proposed to use Canonical Correlation Analysis (CCA), and deep Boltzmann machine to approach the task. Due to the efficiency of hashing-based methods, there also exists a rich line of work focusing the problem of mapping multi-modal high-dimensional data to low-dimensional hash codes, such as discriminative coupled dictionary hashing (DCDH) , Cross-view Hashing (CVH) , and so on. In short text segments (e.g., micro blogs, captions, and tags), the similarities between words are especially important for retrieval. For example: *journey* vs. *travel*, *coast* vs. *shore*. According to human-assigned similarity judgments, more than 90% of subjects

thought that these pairs of words had similar meanings. Motivated by the success of continuous space word representations (also called word embeddings) in a variety of tasks, in this work we propose to incorporate word embeddings to meet these challenges.

Words in a text are embedded in a continuous space, which can be viewed as Bag-of-Embedded-Words (BoEW). Since the number of words in a text is dynamic, in , we proposed a method to aggregate it into a fixed length Fisher Vector (FV), using a Fisher kernel framework . However, the proposed method only focuses on textual information. Another challenge in this task is how to determine the correlation between multi-modal representations. Since we propose the use of a Fisher kernel framework to represent the textual information, we also use it to aggregate the SIFT descriptors of images. Through the Fisher kernel framework, both textual and visual information is mapped to points in the gradient space of a Riemannian manifold. However, the relationships that exist between FVs of different modalities are usually highly non-linear. Hence, to construct the correlation between textual and visual modalities, we introduce a DBN based method to model the mapping function, which is used to convert abstract representations of different modalities from one to another.

II. PROPOSED METHOD

The processing flow of the proposed semantic cross-media hashing (SCMH) method is illustrated in Fig. 1. Given a collection of text-image bi-modality data, we firstly represent image and text respectively. Through table lookup, all the words in a text are transformed to distributed vectors generated by the word embeddings learning methods. For representing images, we use SIFT detector to extract image key points. SIFT descriptor is used to calculate descriptors of the extracted key points. After these steps, a variable size set of points in the embeddings space represents the text, and a variable size set of points in SIFT descriptor space represents each image. Then, the Fisher kernel framework is utilized to aggregate these points in different spaces into fixed length vectors, which can also be considered as points in the gradient space of the Riemannian manifold. Henceforth, texts and images are represented by vectors with fixed length. Finally, the mapping functions between textual and visual Fisher vectors (FVs) are learned by a deep neural network. We use the learned mapping function to convert FVs of one modality to another. Hash code generation methods are used to transfer FVs of different modalities to short length binary vectors.

Representation of words as continuous vectors recently has been shown to benefit performance for a variety of NLP and IR tasks. Similar words tend to be close to each other with the vector representation. Hence, in this work, we propose to use word embeddings to capture the semantic level similarities between short text segments. We denote a text or an image $X = \{x_i, 1 \le i \le |X|\}$, where x_i is the embedding of ith word of a text or the SIFT descriptors of the ith key point of an image, $|X|$ is the number of words in a text or the number of the extracted key points in an image. x_i is D-dimension word embeddings or SIFT descriptors. Through Fisher kernel framework, these points are aggregated to a 2NT-dimensional vector. To transfer the FVs of one modality to another, we
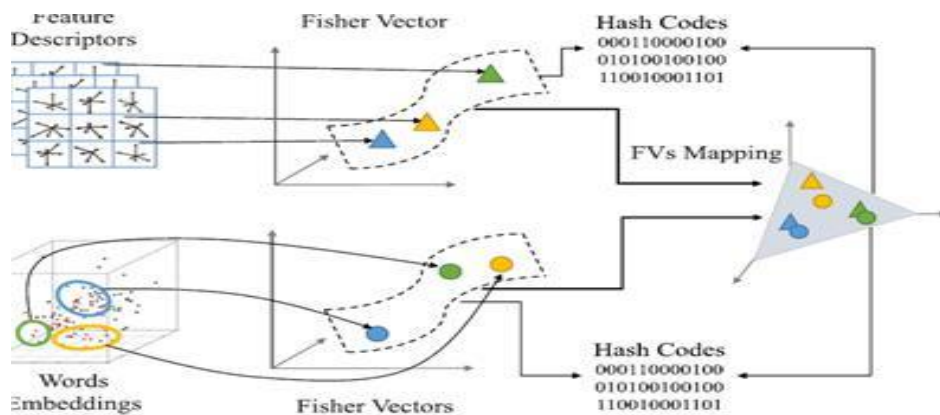
Fig. 1: An overview processing flow of the proposed SCMH for cross-media retrieval.

Propose to use a deep belief network with one hidden layer to achieve the task. The building block of the network used in this work is the Gaussian restricted Boltzmann machine. Because we have converted both textual and visual information into the gradient space of a Riemannian manifold, we in this work use a single hidden layer model to do it.

III.EXPERIMENTS

The three data sets used in this example contain both texts and images. They have been chosen for the purpose of evaluating various cross-media retrieval methods. The MIR Flickr data set, which consists of one million images along with their user assigned tags, was collected from Flickr. The LabelMe data set contains 2,688 images, which belong to eight outdoor scene categories. The NUS-WIDE data set contains images and their associated tags from Flickr. Following previous works, each image may belong to one or more concepts. Image-text pairs are considered to be similar if they share the same concept. In NUS-WIDE data set, the relative improvements of SCMH over LSSH, which achieves the best results in these datasets, are 10.0% and 18.5% on the Text→Image and Image→Text tasks respectively. Experimental results demonstrate the effectiveness of the proposed method on the cross-media retrieval task.

IV.CONCLUSIONS

In this work, we propose a novel hashing method, SCMH, to perform the near-duplicate detection and cross media re-trieval task. We propose to use a set of word embeddings to represent textual information. Fisher kernel framework is incorporated to represent both textual and visual information with fixed length vectors. For mapping the Fisher vectors of different modalities, a deep belief network is proposed to perform the task. We evaluate the proposed method SCMH on three commonly used data sets. SCMH achieves better results than state-of-the-art methods with different the lengths of hash codes.

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A Novel Dual Broadband modified Circular Patch Antenna For Wireless Application

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Abstract – This paper presents a circular patch micro strip antenna operate in dual band (1.66 GHz and 2.777GHz). The proposed Circular patch antenna will be in light weight, flexible, slim and compact unit compare with current antenna used in dual band. The paper also presents the detail steps of designing the circular patch micro strip antenna and the simulated result. HFFS software is used to compute the gain, power, radiation pattern, and S11 of the antenna. The circular micro strip antenna exhibits appropriate required parameters depend on the feed point position, size of the circular patch and length of the micro strip line. The agreement between the measured and simulated results is slightly differ caused by several factors that would be discussed in result part.

Keywords: Circular microstrip antenna, feed line, cavity model

I. INTRODUCTION

Microstrip antennas are used in communication systems due to simplicity in structure, conformability, low manufacturing cost, and very versatile in terms of resonant frequency, polarization, pattern and impedance at the particular patch shape and model. The performance of the antenna is affected by the patch geometry, substrate properties and feed techniques. In a circular microstrip antenna, the mode is supported by the circle shape on a substrate with height is very small compared to wavelength (h<< λ). Referring to the dimensions of the circular patch , only one degree freedom to control the radius, a of the patch. This would not change the order of the modes but the absolute value of the resonant frequency. Basically a circular micro strip antenna can only be analyzed via the cavity model and full-wave analysis. The cavity model also provides the method that the normalized fields within the dielectric substrate can be found more accurately and it does not radiate any power . Microstrip antennas have profound applications especially in the field of medical, military, mobile and satellite communications. Their utilization has become diverse because of their small size and light weight. Rapid and cost effective fabrication is especially important when it comes to the prototyping of antennas for their performance evaluation.As wireless applications require more and more bandwidth, the demand for wideband antennas operating at higher frequencies becomes inevitable. Inherently micro strip antennas have narrow bandwidth and low efficiency and their performance greatly depends on the substrate parameters i.e. its dielectric constant, uniformity and loss tangent . The microstrip antennas are mostly a broadside radiator.

The patch is designed in such a way so that its pattern is maximum normal to it. End-fire radiator can also be chosen by proper mode selection. The microstrip patch antennas is one of the most useful antennas working at microwave frequencies ($f > 1$ GHz). It consists of a metallic "patch" on top of the dielectric substrate and below the dielectric material it has ground plane. The position of the feed has to be changed as before to control the input impedance. The patch, microstrip transmission line (or input, output pin of coaxial probe), and ground plane are made of high conductive material (typically copper). The patch may be in a variety of shapes, but rectangular and circular are the most common because ease of analysis and fabrication, attractive radiation characteristics, especially low cross polarization After rectangular patch the next configuration is the circular patch (as shown in figure 1) which has varying applications as a single patch element as well as in arrays. The modes that are supported primarily by a circular microstrip patch antenna whose substrate height is small *(h <<λ)* are TM^Z where *z* is taken perpendicular to the patch. The circular patch has only one degree of freedom to control i.e. radius of the patch.
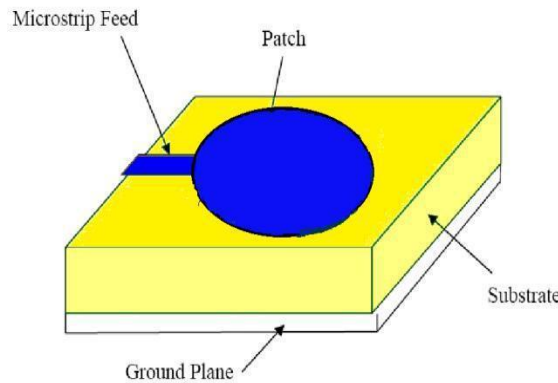
A. Antenna Parameters

An antenna is the transitional radio between free space and a guiding device. In order to be able to design a good antenna, it's crucial to consider some of the basic but yet important parameters that characterize all antenna design.

B. Gain

G = η .D, where, η= efficiency, D = directivity

C. Directivity

Directivity is the same as gain, but with one difference. It does not include the effects of power lost (inefficiency) in the antenna. If an antenna were lossless (100% efficient), then the gain and directivity (in a given direction) would be the same.

D. Radiation Pattern

Radiation pattern is defined as the power radiated or received by an antenna in a function of the angular position and radial distance from the antenna. It describes how the antenna directs the energy it radiates.The gain of an antenna is the radiation intensity in a given direction divided by the radiation intensity that would be obtained if the antenna radiated all the power equally to all directions.the definition of the gain requires the concept of an isotropic radiator; that is, one that radiates the same power in all directions. Gain usually expressed in db. Gain can be obtained by using equation

E. Antenna Efficiency

The antenna efficiency is defined as the ratio of total power radiated by the antenna to the input power of the antenna. Just like any other microwave components, an antenna may dissipate power due to conductor loss or dielectric loss.

F. Return Loss

Return loss is a convenient way to characterize the input and output signal sources. Return loss can be defined in dB.

II. METHODOLOGY

A circular microstrip patch antenna designing is easier than other patch configuration as we only need one design parameter i.e. radius of the patch. A schematic of circular patch antenna is shown in figure .In the typical design procedure of the Microstrip antenna, the desired resonant frequency, thickness and dielectric constant of the substrate are known or selected initially. In this design of rectangular Microstrip antenna, FR4dielectric material (ε_r=4.4) with dielectric loss tangent of 0.02 is selected as the[110] substrate with 1.6 mm height. Then, a patch antenna that operates at the specified operating frequency f_0 = 1.66 GHz and

2.77 GHz can be designed by using transmission line model equations [5]. Inset feeding used as a feeding method.

Formulas used for calculating radius (a) -

$$a = F \left\{ 1 + \frac{2h}{\pi F \varepsilon_r} \left[\ln \left(\frac{\pi F}{2h} \right) + 1.7726 \right] \right\}^{-1/2}$$
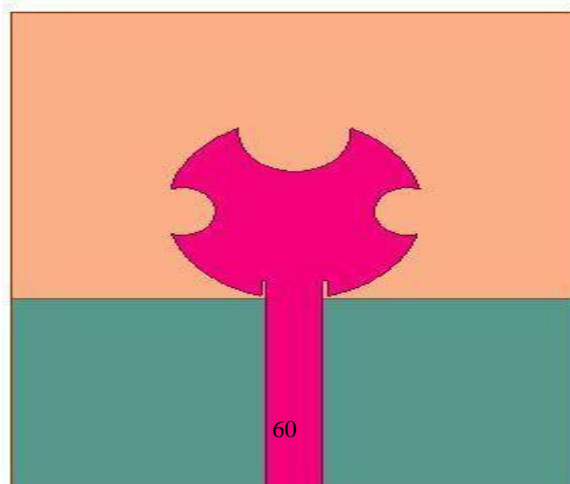
Where,

$$F = \frac{8.791 \times 10^9}{f_r \sqrt{\varepsilon_r}}$$

The units of h must be in mm. and f_r in GHz.

Geometry of Proposed Antenna

These above parameters are analysed and used in designing microstrip patch antenna in IE3d simulator. After designing antenna in IE3D, simulation is done. And all the resultant parameters return loss; VSWR, input impedance etc. are achieved.
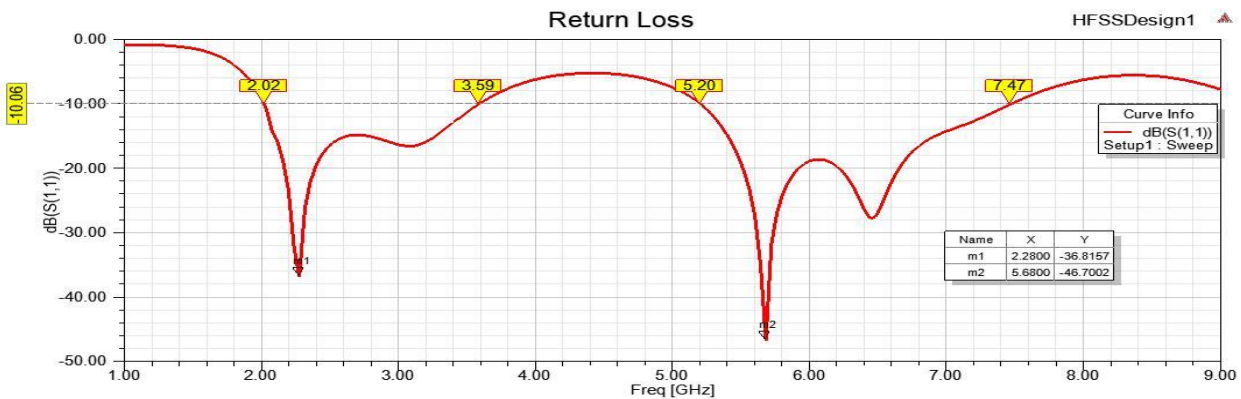
III.SIMULATION AND RESULTS:

Return Loss and bandwidth

This antenna have shown -24.596 dB return loss at 1.666 GHz and -16.4490 dB return loss at 2.77 GHz resonant frequencies and obtained bandwidth is 36.14 MHz and 53.99 MHz which is shown in figure . At the resonant frequencies antenna radiate maximum power.
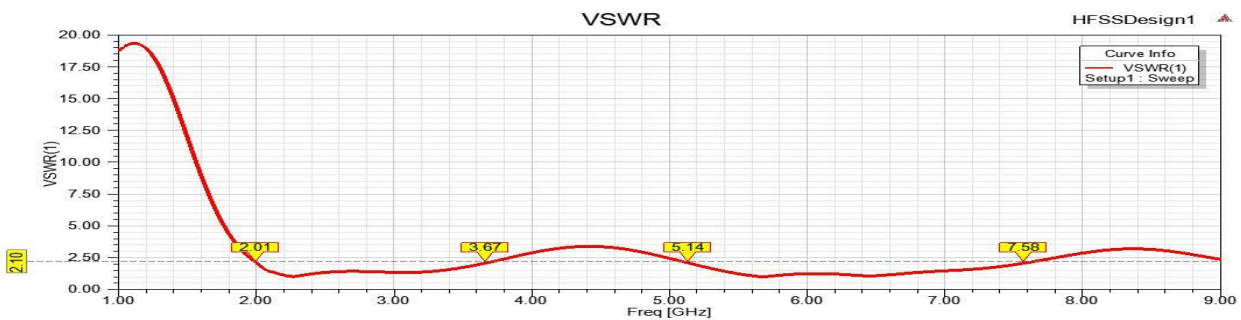
Return Loss Characteristics of NBCPA

VSWR

The voltage standing wave ratio (VSWR) for the circular patch antenna at our design frequencies of 1.66GHz and 2.77GHz. VSWR is a measure of impedance mismatch. As can be observed from the graph, the VSWR obtained are 1.125:1 and1.354:1. This is considered a good value as the level of mismatch is not very high.

VSWR Characteristics of NBCPA

Gain

Gain of NBCPA at 2.28 GHz
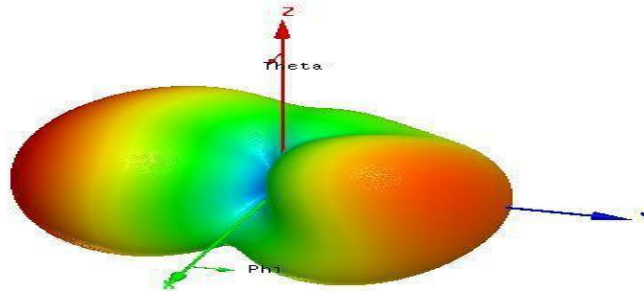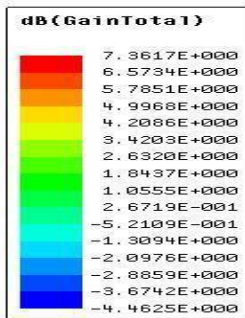
Gain of NBCPA at 5.68 GHz

Radiation pattern

Radiation Pattern of NBCPA at 2.28 GHz
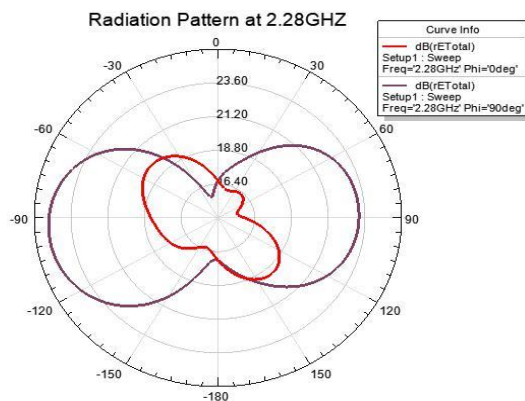
Radiation Pattern of NBCPA at 5.68 GHz
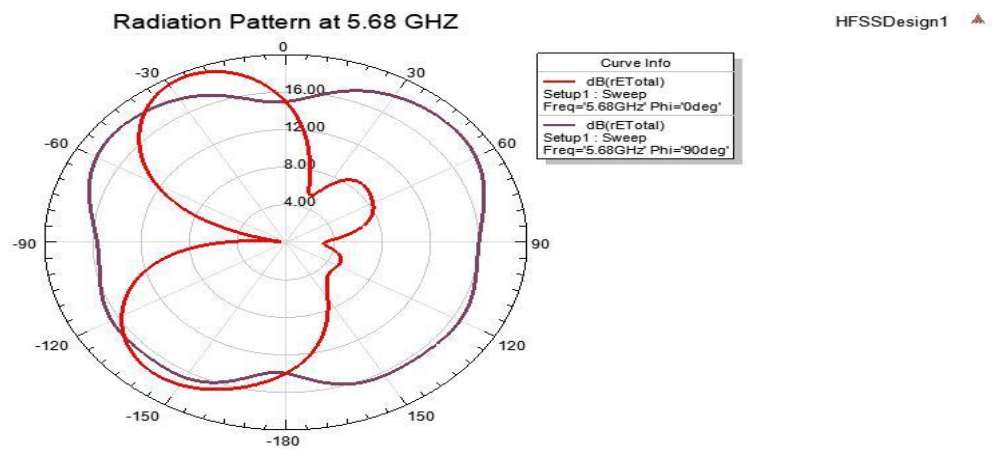
IV. CONCLUSION

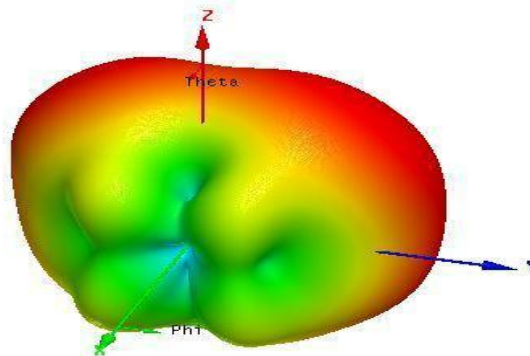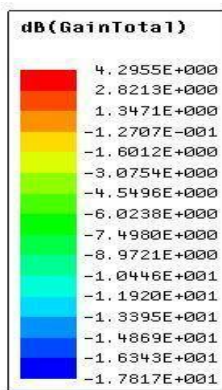After the whole analysis the characteristics of proposed antenna enhanced at many parameters. Obtained dual band at 1.66 GHz and 2.77 GHz frequencies, so it can say that clearly this antenna is perfect for L-Band applications such as radar communication, military communication. Band width is also acceptable for both bands.

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Design of a 60 GHz Power Amplifier utilizing 90nm CMOS Technology

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Abstract

In order to satisfy the short-distance high-speed wireless transmission communication system, such as Wireless Personal Area Net-work (WPAN) applications. A 60GHz high efficiency single ended power amplifier is proposed, which is with three stages cascade structure, and it is design with SMIC 90nm 1P9M CMOS technology. The on-chip spiral inductor with small inductance and high-quality factor is designed with the top metal layer, this type of spiral inductor can be used as the passive circuit for input, output and inter-stage impedance matching network circuits design in order to improve the overall performance of the PA. The additional power efficiency will be increased by the reduction of the transmission losses and output matching losses. The simulation results show that the power amplifier can achieve the power gain of 17.2dB, the output power is 8.1dBm at 1dB compression point, the saturated output power is 12.1dBm, the peak power additional efficiency is 15.7% and the DC power consumption is 70mw at 1.2 V voltage supply.

1. Introduction

In recent years, as demand for high data rates for short-range communications within 10 meters has been on the rise, unlicensed bands (59-64 GHz) driven by the 802.11ad and 802.15c standards are of worldwide concern. 60GHz technology with high data transmission capacity, high security, strong anti-interference ability [1]. CMOS technology is used in millimeter-wave front-end circuit design due to its low cost and high integration. The main challenge in integrating millimeter-wave communications using low-cost technology is to design a power amplifier (PA) that meets power requirements. However, the low breakdown voltage of CMOS devices greatly limits the output power. How to improve the power added efficiency (PAE) when the maximum output power is obtained is the biggest challenge to design a millimeter wave PA. Up to now, some well-behaved 60GHz CMOS power amplifiers [2-10] have been reported in the literature. The PAEs of PA are mostly below 12% at high gain or high output power. The research by P.H. Chiang et al. [8] shows that the saturation output power can be as high as 16dBm through multiple coupling, but the power gain and PAE are only 9.2dB and 7.2% respectively. Studies by Y.S. Lin et al. [9] obtained gains of up to 30 dB using a cascade of 5 stages, but with a PAE of only 9.7%.

The first section of the article mainly introduces the power amplifier design considerations, to analyze the additional power efficiency; Section 2 introduces the circuit layout and simulation results;

Section 3 gives the conclusion.

2. PA Circuit Design and Analysis

2.1 Overall design and analysis

The design of CMOS millimeter-wave power amplifiers is limited by the output voltage swing and low power gain due to low transconductance of the transistors. So its design needs to compromise between power gain, linearity and efficiency

$$FoM_{PA} = P_{out} \times G \times PAE \times f^2$$

Power amplifier power efficiency (PAE) is:

$$PAE = \frac{P_{out} - P_{in}}{P_{diss}} \times 100\% \qquad (2)$$

Based on the load-pull theory, the maximum output power of the amplifier can be obtained by performing load impedance transformation on the output impedance of the amplifier:

$$P_{sat\ max} = 10 \log(10^3 \times \frac{1}{2} |V_{load} \times I_{load}|\ ) \qquad (3)$$

The millimeter-wave band loss for the entire circuit will have a tremendous impact. So the value of the load drawn by the load is not the best load value, consider the loss of the output matching network will be saturated Output:

$$P_{sat\ 50\Omega} = P_{sat\ max} - P_{match\_loss} \qquad (4)$$

According to [11], the closer the output load value is to 50Ω, the smaller the output matching loss is. In this paper, by increasing the size of the power amplifier output stage transistor to increase its saturation output power to meet the system requirements and make the load impedance close to 50Ω, in order to minimize the matching loss and improve the power amplifier PAE. In fact, unlike low-frequency applications whose operating frequency is farther away from the transistor's maximum oscillation frequency (fmax), the output power of the device shows a quasi-logarithmic increase with increasing transistor size. At 60 GHz, the increase in device size also depends on the parasitic effects of the transistor, that is, the gate-to-source capacitance, the gate-to-drain capacitance, and the access resistance, which are compromised.

2.2 Small inductor design.

In 60GHz frequency band, the inductance value that the circuit design needs is very small, the range is between 50pH and 200pH. Inductance of on-chip spiral inductor provided in CMOS technology library is too large and self-resonant frequency is less than 60 GHz, which does not meet the circuit design requirements. The published 60GHz power amplifiers, most of them using the simple structure, easy to model the transmission lines (such as microstrip line [4], coplanar waveguide [5], grounded coplanar waveguide [3]) to achieve small inductance function..

This paper proposes the design of spiral inductors using metal_9. HFSS 13.0 modeling and electromagnetic field simulation analysis, which can be used for Cadence layout design of small inductance. An inductor model that meets the PA circuit design requirements is shown in Fig. 1, with an internal diameter of 25μm, a linewidth of 5μm, an equivalent inductance of 110pH and a quality factor Q of 21. The area is only 42μm×42μm.
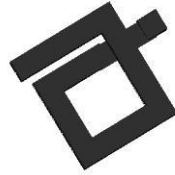
Fig. 1 Uses the top metal design of the inductor

2.3 Core circuit design

In this paper, all the circuits of the power amplifier are biased in Class A, and the first stage adopts a Cascode structure with adaptive bias (with inductive negative feedback). This is to improve the gate oxide breakdown problem, but also reduces the hot carrier effect and increases the reliability and lifetime of the device. At the same time using Cascode structure can get higher gain, better reverse isolation, reduce Miller effect, taking into account the input / output matching. Both the second and third stages are common-source topologies for better linearity and higher efficiency at low supply voltages. Circuit structure shown in Fig. 2.
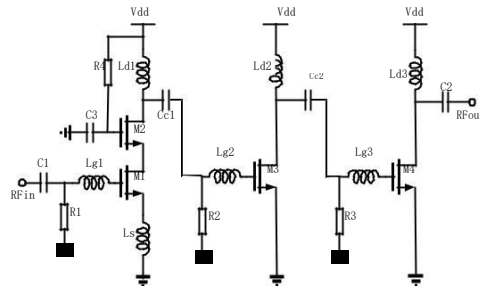

Fig. 2 60GHz power amplifier circuit

According to[3], when the transistor drain current density is 0.15mA/μm, 0.2mA/μm and 0.3mA/μm, they correspond to the minimum noise figure, the maximum power gain and the optimal linearity, respectively. Therefore, the first-level transistor current density is biased at 0.2 mA / μm to obtain the maximum power gain, and the second-level and third-level transistor current densities are biased to 0.28 mA / μm to obtain sufficient linearity.

$$P_{\max} = \frac{I_{DC} \times \left(V_{DD} - V_{ds,\,sat}\right)}{2} \tag{5}$$

$I_{swing} = \left(0.4\mathrm{m}A\,/\,\mathrm{\mu m}\right) \times W$ as the 1dB compression point before the maximum swing current, instead of $2 \times I_{DC}$ available P1dB:

$$P_{1dB} = \frac{I_{swing} \times \left(V_{DD} - V_{ds,\,sat}\right)}{} \tag{6}$$

3. Layout Design and Simulation Analysis

3.1 Layout design

In this paper, PA SMIC 90nm 1P9M RF CMOS process, complete the layout design in Cadence virtuoso platform. The spiral inductors used in the layout are all geometric parameters given by HFSS for electromagnetic field simulation. Capacitors use MIM capacitors with a capacitance of 1.0 fF / um2. In layout design, in order to reduce the parasitic capacitance, coupling and other losses caused by the power line as much as possible to use a thick top metal (thickness of 3μm) alignment, while reducing the layout area as much as possible to reduce the alignment Length, input and output to maintain the farthest, left into the right out. Layout shown in Fig. 3, the area (400μm × 300μm).

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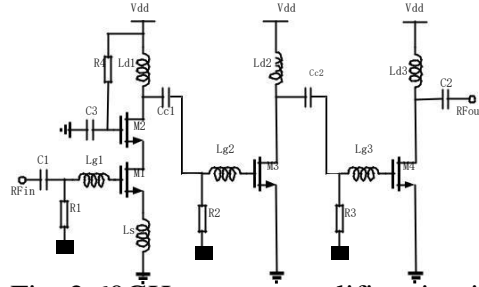

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IV.CONCLUSION

Based on the SMIC 90nm CMOS process, this paper presents a three-stage cascaded power amplifier with operating voltage of 1.2V applied in the 60GHz frequency band. By analyzing the output loss and device size, etc., the power added efficiency is improved. The cascode and common source structure are used to improve the circuit gain. The electromagnetic inductance of the spiral inductor on the small inductance chip is designed to improve the overall performance of the circuit. Layout area of 400μm × 300μm, saturated output power of 12.1dBm, gain of 17.2dB, additional power efficiency of 15.7%, the overall performance is good, to 60GHz short-range wireless communication system requirements.

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Plant Based Completely Biodegradable Printed Circuit Boards

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Abstract - Completely biodegradable printed circuit boards (PCBs) have been developed using bio-composites made from natural cellulose fibers extracted from banana stems and wheat gluten, which are normally considered as agricultural wastes or co-products. PCBs were fabricated using these composites with properties suitable for electronic applications. The bio-composites are free of chemicals, and an environmentally benign approach was adopted to fabricate the PCBs. Conventional PCBs are critical components in electronics and are currently made using fire resistant plastics (FRPs). FRPs are typically made using glass fibres and epoxy, which are non-biodegradable when disposed in the environment. A significant amount of heat (up to 60 °C) was dissipated through the bio-composite preventing overheating and thus reducing risk of fires. PCBs did not show any deterioration in performance even after exposure to high humidity (90%) or high temperature (100 °C). LED connected to the PCB was able to glow without any interruption. Natural fibres and protein-based PCBs may provide an alternative to the synthetic polymer-based electronic components and help us to reduce the environmental burden due to the disposal of electronic waste (e-waste).

I. INTRODUCTION

Printed Circuit Boards (PCBs) are an integral part of electronic gadgets. The ever increasing use of electronic goods and their short-life span result in generation of considerable amounts of electronic waste (e-waste). A study by United Nations University has estimated that global disposal of-waste was about 41.8 metric tons in 2014. Although most countries have laws that regulate disposal of e-waste and promote take-back systems, only about 6.5 tons of e-waste was collected for recycling [1]. In most cases, recycling of e-waste is not done scientifically, and the processes used to recollect the parts and metals cause substantial harm to the environment. Electronic goods contain metals such as mercury, cadmium, and lead and chemicals such as brominated flame retardants, polychlorinated biphenyls, and hexavalent chromium, which have been reported to impair mental development, and also cause damage to lung, liver, and kidneys.

Since the use of electronic goods will continue to increase, attempts are being made to improve the recyclability and reuse of e-waste. PCBs are particularly difficult to recycle due to their complex structure and diverse components that they house [2].

Similarly, proteins are generated as co-products during the processing of cereals for food or feed applications. In addition to using renewable and sustainable not contain any chemicals and will completely degrade when disposed in the environment. In this report, we have used two renewable, sustainable, and agricultural waste/co-products (banana fibers and wheat

gluten) as examples of reinforcement and matrix, respectively, to demonstrate the feasibility of developing completely bio-degradable PCBs. PCBs have been fabricated on the bio-composites, and the performance of the PCB including dielectric properties, electrical performance, and fire resistance has been studied.

II. MATERIALS AND METHODS

A. Materials

Banana fibers were purchased from Tamil Nadu Agricultural University, Coimbatore. These fibers are extracted from the stem of banana plant using mechanical means and without the use of any chemicals. Wheat gluten with a protein content of about 80% was purchased from TamilNadu Agricultural UniversityCoimbatore. Electrical components required for preparing the PCB were purchased from local vendors. Banana mat naturally available. soya resin purchased from vendors.

B. Preparation of the Composites ratio:

Banana fibers were carded to form a mat. Wheat gluten was sprayed onto the carded mat by hand in a predetermined fiber and matrix ratio. Four different ratios of fiber to protein were used to prepare the composites.

TABLE 1

Banana fibre	10	8	12	12
Soya resin	4	4	6	6
Banana mat	18	18	10	12
Wheat gluten	4	6	8	6

Finally the last ratio is produce successful composite material.

Water equivalent to the weight of the fibre and matrix used was sprayed, and the prepreg was allowed to condition for about 30 min. The wet prepreg was compression molded between two plastic sheets at 180 °C for 8–10 min at a pressure of 3000 PSI. After compression, the mold was cooled by running cold water and the composite formed was collected for further analysis.

Manufacturing process
STEPS FOR COMPOSITE PREPARATION
  Taking Fiber from banana jute
  Remove Water Content from Jute Fiber.
    Making a molding as per specimen Dimension.
    Mix Fiber and wheat Powder
  Make Fiber lamina and using resin fabricate laminate.

Fig.2Before banana mat and resin

Removing dust on the casting scale plate through the release jell.Placing a banana fiber on jell and apply the mixture of water and wheat gluten. Apply the resin on the gluten layer

Fig.3 Before Resin layer

RESIN TRANSFER MOLDING

The resin transfer molding (RTM) technique require the fiber to be placed inside a mold consisting of two solid parts (close-mold technique). A tube connects the mold with a supply of liquid resin, which is injected at low pressure through the mold, impregnating the fibers. The resulting part is cured at room temperature or above until the end of the curing injection pressure, when the mold is opened and the product is removed. Parameters such as injection pressure content, and mold temperature have great influence on the development of the temperature profiles and the thermal boundary layers, especially for thin cavities. This technique has the advantages of rapid manufacturing of large, complex, and high-performance parts. Several types of resins (epoxy, polyester, phenolic, and acrylic) can be used for RTM as long as their viscosity is low enough to ensure proper wetting of the plant fibers.

Fig.4.After Resin layer

Fig.6.Placing resin on the banana mat

Fig.7.Applying wheat and gluten banana fiberon the resin layer

Fig.8.Covered to the layer in Aluminum plate and ready for the compression

Fig.9.After the Compression the composite material has to be compressed

Tensile and bend test machine
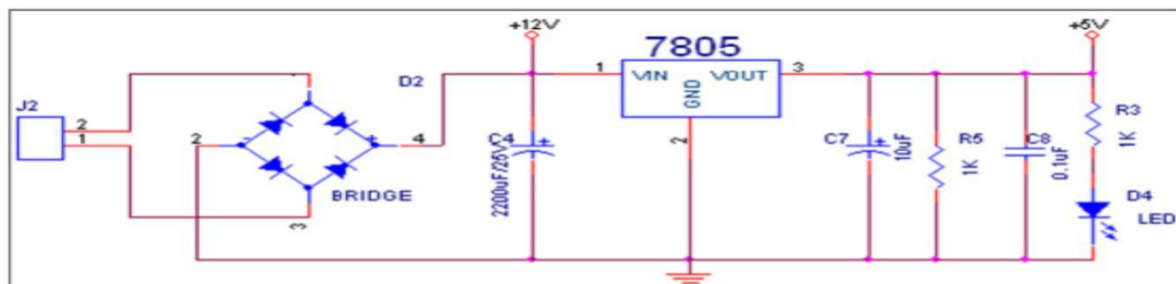
H. Evaluating the Performance of the PCB

Ability of the biodegradable PCB to be used in electronic applications was tested using a simple voltage regulator circuit. The circuit comprised of a transformer, a full wave rectifier circuit with capacitive filters, and a linear voltage regulator

integrated circuit LM7805 and IN4007 diode. A similar circuit was adopted on a conventional FR-4 PCB for comparison with the bio-composite PCB. A general purpose glass fibre reinforced epoxy laminate PCB (FR-4) and the biodegradable PCB mounted with electronic components were used as a voltage regulator. An LED was used as load in the voltage regulator circuit in both conventional and bio-composite PCB. Deviations in the

signal waveforms between the conventional and bio-composites PCB were determined using a digital storage

I. Effect of Humidity and Temperature

oscilloscope (12 GHz, TDS6124C DSO).

Ability of the biodegradable PCB to withstand high humidity and temperatures was studied. PCB containing the components was placed in a humidity chamber at 90% humidity for 24 to 48 h. After conditioning, the PCB was immediately tested and the output waveforms were analyzed. Similarly, the PCB was placed in a hot air oven at 100 °C for 8 h and the changes in the output (wave forms) were measured.
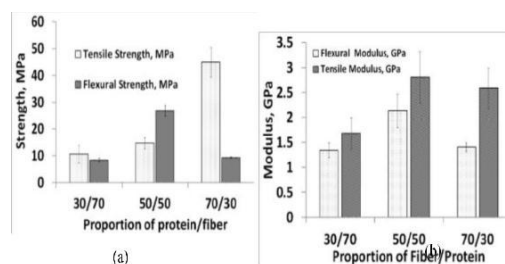

Fig. 1. (a) Tensile   an modusanl (b) flexuralstrengtAn modulus of the biocomposites.

RESULTS AND DISCUSSION

A. Mechanical Properties of the Bio-composite PCB

Amount of reinforcement and matrix influenced both the tensile and flexural properties of the bio-composite. Increasing proportion of banana fibres from 30% to 50% increased the tensile strength marginally but the flexural strength increases by nearly 300%. Further increase in the fibre content increased the tensile strength by about 300% but the flexural strength decreased by about 300% (Fig. 1). Modulus (Fig. 1) of the composites showed a different trend than strength. Both flexural and tensile modulus increased when protein ratio is increased from 30% to 50%. At 70% of fibre, the tensile and flexural moduli are lower than at 50/50. Strength and modulus are related to the properties of the materials and the binding between the reinforcement and matrix. At low protein concentrations, there is poor binding due to insufficient matrix and hence the flexural and tensile properties are lower. Similarly, at high fibre content, there is a lack of adequate binder and hence the properties decrease. Among the three different ratios of banana fibre/ protein studied, an optimum of 50% of fibre and 50% of matrix provided the highest tensile properties to the composites (Fig. 1). Commercially available FR-4 PCBs are reported to have a flexural strength higher than 440 MPa and tensile strength higher than 310 MPa. Highest flexural and tensile strength obtained for the bio-composites in this paper was 27 and45 MPa, respectively. Although the tensile properties of the bio-composites are considerably lower than that of the FR-4, it should be noted that the density of the bio-composites was about 1.03 g/cm3 compared with 1.85 g/cm3 for FR-4.

B. Flame Resistance

Irrespective of the amount of protein and fibres, the bio-composites exhibited good flame resistance and passed the UL-94 V-1 classification requirements (Table I). As seen from Fig. 2, flames were able to propagate through the composite but were self-extinguished. The burned sample (1C) was intact without any dripping, which is desirable to prevent damage to other components. Typical FR-4 PCBs have a higher flame resistance rating of V-0.

C. Dielectric Properties

The 50/50fiber/protein composite had dielectric values ranging from 2.38 to 50.38 when the frequency was varied from 0.13 to 107MHz. The dielectric constant (Fig. 3) also varied with temperature with higher temperature decreasing the constant, particularly at higher frequencies. There was considerable decrease in the dielectric constant when the temperature was increased from 25 °C to 60 °C but subsequent increase in temperature up to 120 °C showed marginal decrease. In fact, the dielectric constants at 60 °C and 100 °C overlap with each other. Higher temperatures remove moisture leading to reduction in the dielectric values.

D. Heat Dissipation

Bio-composite was able to dissipate considerable amount of the heat generated, a property highly desirable for electronic applications. After reaching steady state, the temperature at the base of the regulator was consistently at about 130 °C for the entire test period of 2 h. Maximum temperature recorded the thermocouple at the other side of the composite and directly below the regulator was 87 °C. A heat loss of about 43 °C (Fig. 5) had occurred suggesting that the bio-composite was able to dissipate considerable amounts of heat mainly due to its porous structure. Ability to dissipate heat would prevent over heating of the components and may also reduce the risk of fire. Increasing thickness of the composite or changing the proportion of proteins and fibre could lead to further increase in heat dissipation .
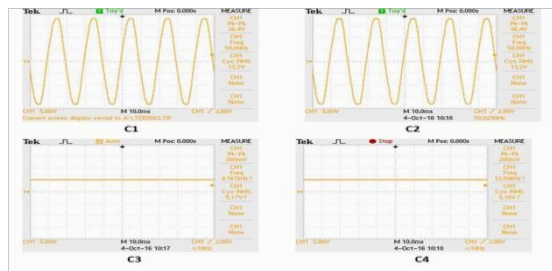

Fig. . Electronic device fabricated on the bio-composites had similar waveform compared with a standard FR-4 (C1 and C3 are input and output wave forms for FR 4, respectively, and C2 and C4 are input and output waveforms for bio-composites-based PCB).

E. Comparison of the Wave Forms

Fig. 6 shows the input sinewave from the transformer used in the voltage regulator circuit in conventional PCB (FR4) and bio-composite PCB, respectively. The dc regulated output voltage from conventional PCB (FR4) and bio-composite shows that the input waveform and the regulated output from both conventional PCB and bio-composite PCB are identical. Ideally, the regulated output voltage should be 5 V from LM7805 integrated circuit with a tolerance of +/−4%. Bio-composite PCB produced a voltage of 5.26 V compared with 5.30 V in the FR4 PCB. A slight clamping in input waveform was observed, since the PCBs were powered from an inverter line which regenerated ac from dc. An LED connected through the circuit in the PCB was able to glow without any interruption (Fig. 7). Further evaluation of the PCB using an ac circuit will validate the applicability of the PCB for all electronics.
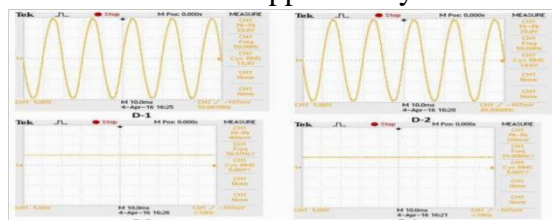

Fig. 8. There was no deviation in the performance of the electronic device on the bio-composites even after exposure to 90% humidity for 48 h or 100 °C for 8 h. D1 and D3 are input and output waveforms for FR 4, respectively, and D2 and D4 are input and output waveforms for bio-composites-based PCB after exposure to 90% humidity for 48 h.

IV. CONCLUSION

A completely biodegradable PCB was developed using a natural protein and natural cellulose fiber. No chemicals were used during the preparation of the PCB making it completely environmentally friendly. No loss in performance of the bio-composite PCB was observed even after exposure to 100 °C for 8 h. We have demonstrated the feasibility of using agricultural waste/co-products to develop biodegradable PCBs. This project paves the way for exploring the innumerable options available to develop agricultural waste-based bio-composites for PCBs and other electronic applications. Although matching the mechanical properties of an FR-4 PCB by the bio-composite may be a challenge, PCBs with lower mechanical properties may be sufficient for most applications. We demonstrated a simple, environmentally friendly, cost-effective, and efficient method to fabricate completely biodegradable bio-composites. The relatively short span of modern electronic gadgets and increasing affordability and consequent dumping of e-waste is a major environmental concern. Biodegradable PCBs could be a stepping stone in adopting bio-composites and biopolymers, specifically those derived from agricultural byproducts and co-product for electronic goods.

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Implementation of image processing technique for detection of brain tumors using MRI

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Abstract - Brain tumor is a perilous disease which causes brain damage. So, detection and classification of brain tumor in early stage is necessary. The brain tumor may be of cancerous (malignant) or may be of non-cancerous (Benign) and its detection is a very much important to reduce the death rate of human suffering from tumor. The detection of brain tumor can be performed by using various image processing techniques like brain magnetic resonance imaging (MRI), Computed Tomography (CT) etc. Among these techniques the brain MRI is widely adopted in the world due to its significant features. The MRI deals with the complicated problem of brain tumor detection. Due to its complexity and variance getting better accuracy is a challenge. The proposed system consists of three parts such as Preprocessing, Feature extraction and Classification. Preprocessing has removed noise in the raw data, feature extraction we used GLCM (Gray Level Co- occurrence Matrix) and classification we used (Extreme Learning Machine). In this paper compare the accuracy results of proposed classification technique (Extreme Learning Machine) to Adaboost classification technique.

Keywords - Magnetic Resonance Image, Brain Tumor, Feature Extraction, Extreme Learning Mechine, Adaboost, Segmentation.

I. INTRODUCTION

Nowadays, most of the brain tumor patient is increasing considerably. The human brain is one of the most important parts of human body. The human body is made up of inorganic matter, made up of cells. The cells grow divide helps us to be healthy but unwanted growth cells tends to tumor forming. The two types of brain tumors one is malignant and another one is benign. In medical diagnosis using image data include X-ray, CT scan and MRI. One of the most reliable technique is Magnetic Resonance image (MRI). The MRI is type of scan that uses strong magnetic field and radio waves to produce detailed images of the inside of the body. The MRI is radiation free then others and a powerful method for detect the brain tumor. But it is very time consuming. some of the machine learning techniques used are ANN, SVM and KNN. But these methods are used results of many problems such as outlier, error rate, mis-classification which we have to address. In this problems overcome the extreme learning machine algorithm are very popular.

In this paper, the classification method for MRI is project using the extreme learning machine algorithm. The ELM (extreme learning machine) is a neural network based model and innovative new data driven tool that utilizes a state of the act layer feed forward network.

II. PROPOSED METHOD

According to the following steps, brain tumors can be detected using image processing techniques.
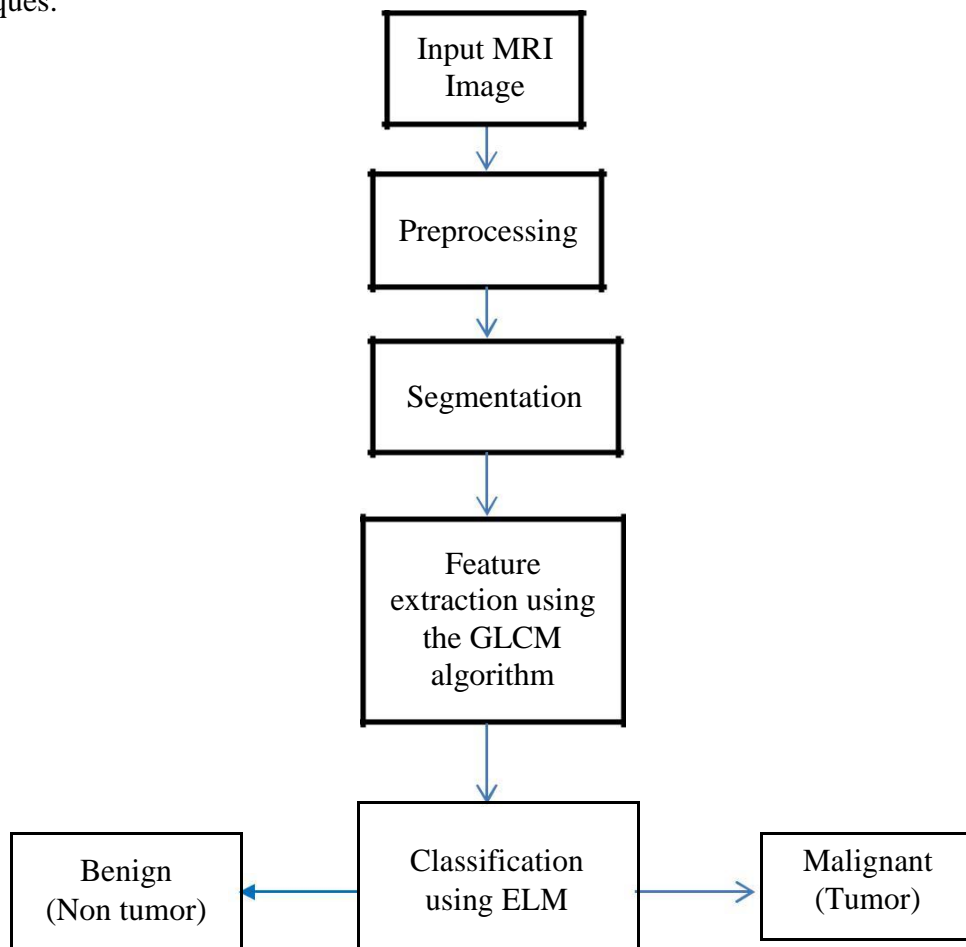
Fig 3.1 Proposed method for brain tumor detection

2.1 Pre-processing

The image preprocessing process is very difficult. The Preprocessing is to remove unwanted, noisy or inconsistent data from the image it improves the quality of images by suppressing unwanted distortions and to make feature extraction phase more reliable.

The brain MR image is segmented by using threshold technique. This technique which divided the image into different segment and select the useful part for further processing.

2.2 Feature Extraction

The feature Extraction is used for the reduces representation set of large data. Feature extraction a unique form of dimensionality Reduction. It Transforms the input data into a set of features. In this stage, the important Features required for image classification are extracted. The Segmented brain MR image is used and texture features are Extracted from the segmented image which illustrate the texture Property of the image.

2.2.1 Correlation:

Correlation is the measure of the relation between the neighbor pixels. Range = [-1,1]

2.2.2 Energy:

The energy is the measure of uniformity between the pixels. Range = [0,1]
The energy is the measure of uniformity between the pixels.

2.2.3 Contrast:

Contrast is the measure of difference in luminance to make object distinguishable. Range=[0,1]

2.2.4 Homogeneity:

The homogeneity measures of closeness of the element distribution in GLCM to GLCM
diagonals. Range = [0,1]
Where, i, j are pixels and p(i,j) is the pixel value
Thus to categorize the brain as normal or abnormal, the MRI Brain images are acquired, preprocessed
and segmented by using Different techniques.

III. Classification Technique:

The Machine learning algorithms are used for classification of MR brain image either as normal or abnormal. The main aim of ML algorithms is to automatically learn and make intelligent conclusions. Extreme learning machine (ELM) belongs to a novel learning method. It is mainly used for regression and classification. The learning time required by ELM is much more faster than traditional algorithms, meanwhile it can achieve better classification results. which consisted of input layer, hidden layer, and output layer. The input neurons are fully linked to the hidden units using random and fixed weights. The biases of hidden layer are also randomly set. The only requirement is that the activation function should be infinitely differentiable. The number of output neurons depends on the problems. For classification, it is the same as the number of classes. Hence, in our method, there are two output units, which stand for healthy and abnormal, respectively. The weights from hidden layer to output space need to be trained. The training method of ELM is minimum norm least-squares (LS) solution.

Kernel based ELM (K-ELM) is a variant of the ELM, which provides different kernel functions for different purposes, like optimization, regression, and classification. The most commonly used kernel functions include wavelet function, radial basis function, linear function, and polynomial function.

In general, the algorithm is expressed as follow: For a training set X=[(xi, ti)| i = 1,2,…, N], suppose the hidden node number is N, we have

Step1 : Assign input weight wi and bias bi at random;
Step2 : Compute the output matrix H of hidden layer;
Step3 : Obtain the output weight β ¼ HþT, where T = [t1, t2,…, tN] T, and H+ represents the Moore–Penrose generalized inverse of H.

IV. EXPERIMENTAL RESULTS

The results are assessed using qualitative and quantitative analysis.

4.1 Qualitative Analysis

The result of the projected system at different stages are shown below
The input MRI is taken from the database

Fig 4.1 Input MRI

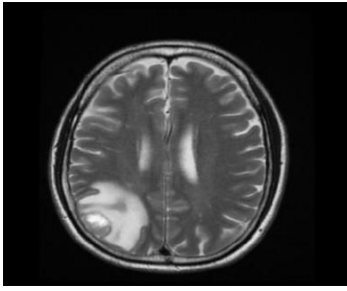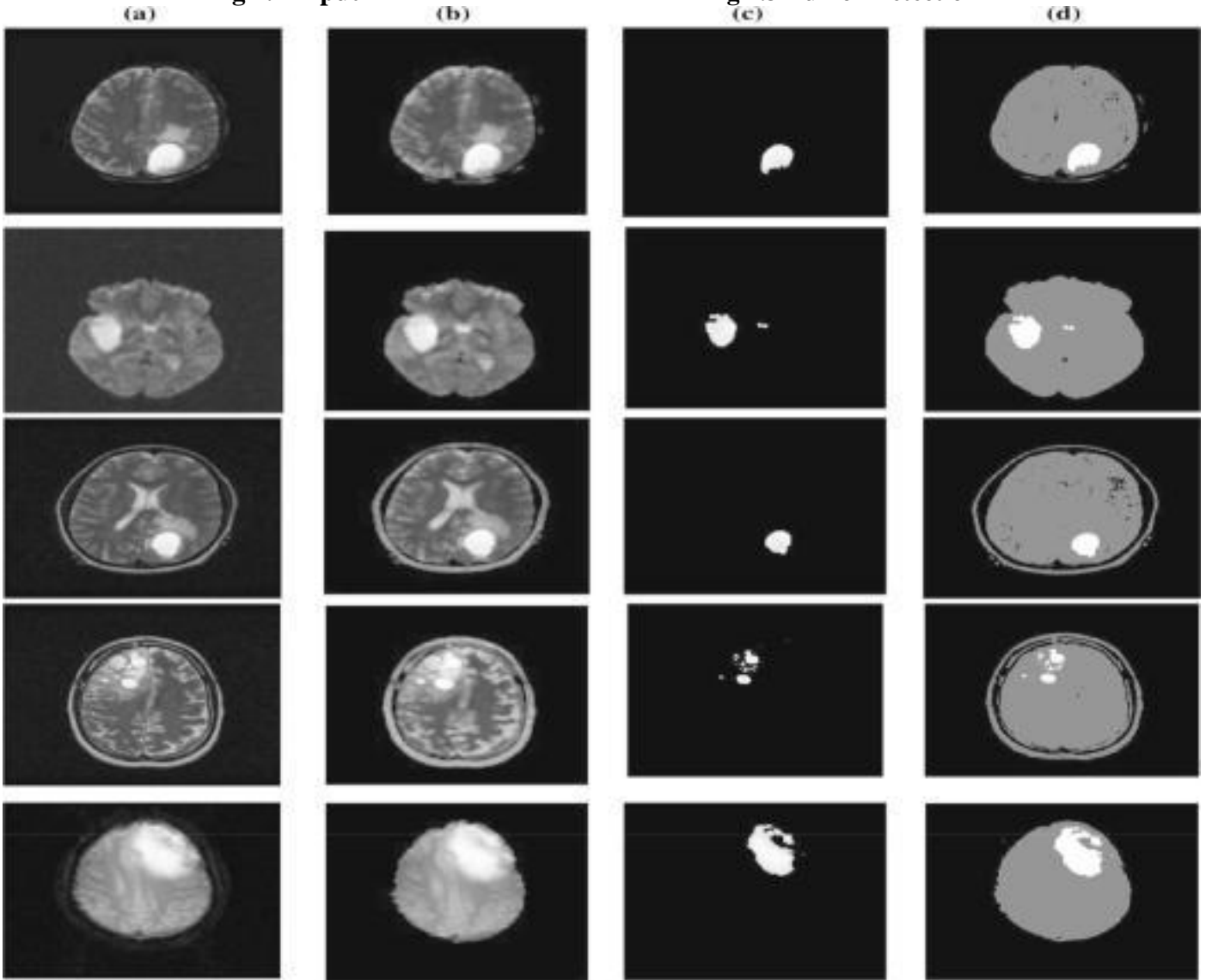**Fig 4.3 Tumor Detection**

Fig 4.2 Segmented Results

4.2 Quantitative analysis

The results of the proposed system are tabulated below

ML Algorithm	Total Samples	Sensitivity (%)	Specificity (%)	Accuracy %
Adaboost	50	88.23	62.5	89.90
ELM	50	94.77	94.78	92.8

TABLE 4.1 EXPERIMENTAL RESULTS ANALYSIS ON LINEAR KERNAL FUNCTION

V. CONCLUSION

In this paper, an automatic brain tumor diagnosis system using new classification technique is proposed. The proposed classification is based on Kernel based ELM (K-ELM) is a variant of the ELM, which provides different kernel functions for different purposes, like optimization, regression, and classification. The most commonly used kernel functions include wavelet function, radial basis function, linear function, and polynomial function. The proposed classification technique is compared with Adaboost algorithm. The evaluation results indicate the effectiveness of the proposed classification method for brain tumor detection. The evaluation results show that the best performance belongs to the brain tumor diagnostic system with proposed classification ELM with kernel, which is more than 92% accuracy.

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Design and Implementation
Of Drawing Robot by using Embedded System

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Abstract: In the recent few years robot is given some artistic behaviour that robot can sing, dance, even robot can play games. This involves a control method of robot arm let the robot acquire a human artistic behaviour "drawing". The Drawing robot is implemented using image processing techniques and Arduino board which is capable of real-time drawing.In the proposed design MATLAB has been used for image processing interface. If the input image is RGB, the image is converted into grayscale image and then to binary image by edge detection method. Sobel and prewitt operators are applied for edge detection method. In the binary image, pixels coordinate position is converted into joint angle by applying inverse kinematics. Based on the output of inverse kinematics, the joint angle value is fed to control the servo motors by the Arduino board. Finally the output image is drawn by the robot arm. The robot can be used for interior design, face recognition, in future we can use the drawing robot in 3D animation field.

Keywords- MATLAB GUI, image processing, Edge detection, Inverse kinematics,Arduino board.

I.INTRODUCTION

A robot is a machine—especially one programmable by a computer— capable of carrying out a complex series of actions automatically. Robots can be guided by an external control device or the control may be embedded within. Robots may be constructed to take on human form but most robots are machines designed to perform a task with no regard to how they look. For many people it is a machine that imitates a human—like the androids in Star Wars, Terminator and Star Trek: The Next Generation. However much these robots capture our imagination, such robots still only inhabit Science Fiction. People still haven't been able to give a robot enough 'common sense' to reliably interact with a dynamic world. However, Rodney Brooks and his team at MIT Artificial Intelligence Lab are working on creating such humanoid robots.

The type of robots that you will encounter most frequently are robots that do work that is too dangerous, boring, onerous, or just plain nasty. Most of the robots in the world are of this

type. They can be found in auto, medical, manufacturing and space industries. In fact, there are over a million of these type of robots working for us today.

II.WORKING PROCEDURE

The input image is taken to the system through MATLAB GUI. Image can be picked from a specified path in computer or can be acquired by a camera connected to serial port. The RGB image is taken, then the system is converts the RGB image into grayscale. And the edge detection method is used to convert the grayscale image into binary image . Binary image is a combination of white and black pixels. MATLAB calculates the necessary inverse kinematics calculation taking black pixel's coordinate position and sends jo int angle for the servos to the controller. Arduino receives the joint angle values through serial communication and controls the servos.

```
┌──────────────────────────────────────┐
│         Image acquisition            │
└──────────────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────────────┐
│            RGB image                 │
└──────────────────────────────────────┘
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                  ▼
┌──────────────────────────────────────┐
│         Grayscale image              │
└──────────────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────────────┐
│    Edge detection using sobel        │
│    and prewitt operator.             │
└──────────────────────────────────────┘
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                  ▼
┌──────────────────────────────────────┐
│        Inverse kinematics            │
└──────────────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────────────┐
│  Transmit joint angle value from     │
│  MATLAB to Arduino                   │
└──────────────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────────────┐
│  Arduino decodes the joint angle for │
│  each servo and send command to the  │
│  servo motor                         │
└──────────────────────────────────────┘
```
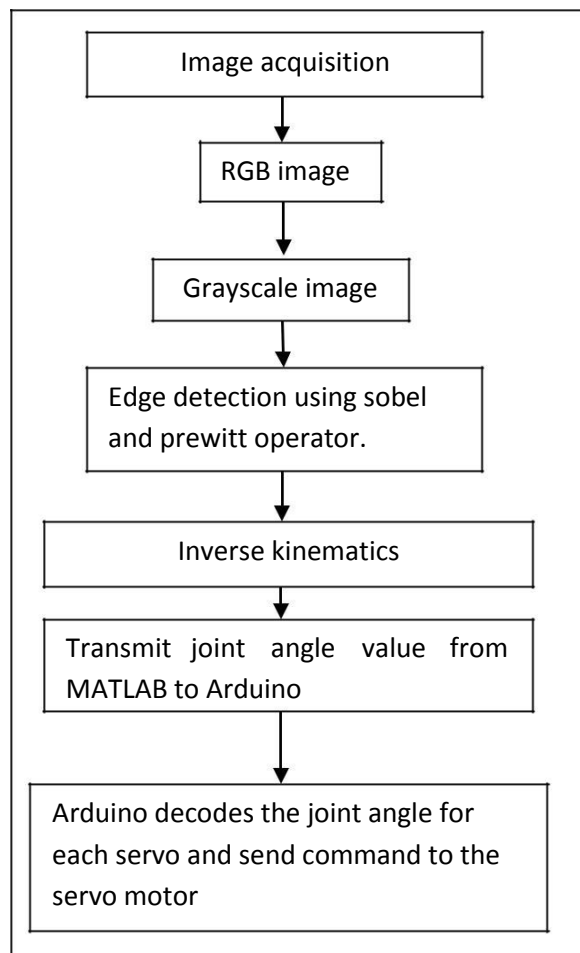
2.1 MATLAB

Matrix laboratory is a multi-paradigm numerical computing atmosphere and programming language was developed by MathWorks. MATLAB is a user interfaces , which allows matrix manipulations, scheming of functions and data   execution of algorithms, and interface with programming languages,   including C, C++, Java and Python.Although MATLAB is intended   for numerical computing of   an optional toolbox uses the MUPAD symbolic engine, allowing access to symbolic computing abilities. An additional

package, Simulink adds a graphical multi-domain simulation and model-based design for dynamic and embedded systems.Matlab is an interactive software system

designed for numerical computations and graphics. Matlab has a very large database algorithm for image processing technique and computer vision applications. It gives many functions used for image processing and multi tasks. Most of these functions are write in Matlab language and are publicly readable not to be customized. There is one more incredible part in Matlab, which is Graphical User Interface (GUI). Graphical User Interface can be considered easily in Matlab. GUI gives an user reward to interact with the system architecture. Matlab GUI has been used to offer an image as input. GUI has two input feature, acquiring an image by a web cam or from a folder inside computer.

2.2 ROBOT ARM

A robot arm is a motorized arm which has similar functions to a human arm and in the case of this project (and usually), is programmable. Robot arms consist of a series of connected links of either revolute or prismatic joints which form a kinematic chain. The end of the kinematic chain, termed the end effecter, is where the tool is located and is analogous to the human hand. There have been several designs of 2-DOF robot arms ad a quick search on the internet proves this. They all vary in structure and size and what their final goals are in most of the systems found on the internet, in the case of typical graduate projects, are 2-DOF arms programmed using inverse kinematics or controlled by external input such as a potentiometer (Ouyang, 2013), or similar type of master/slave edge. They are build using a mainly servos and stepper motors for actuation.The arm consists of two links made of aluminum sheet, one servo mount, two servo motor and a pen holder as an end effector. A proper length of arm is maintained so that it can sketch on a A4 size paper sheet . Here end effector is a pen holder attached with a servo motor.

2.3 IMAGE PROCESSING

Image processing is a method to convert a image into digital form and perform some operations on an image, in order to get an enhanced image or to extract some useful feautures in it. It is a type of signal processing . Edge detection is a part of image processing it includes variety of mathematical methods that aim at identifying points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities. The Edge detection points ,which image brightness changes sharply are usually organized into a set of curved line segments termed edges.

2.4 SOBEL OPERATOR

The Sobel operator is other vise knwon sometimes called the Sobel– Feldman operator or Sobel filter, is used in image processing and computer vision,
particularly withinedge detection algorithms where it creates an image emphasising edges.the masking coefficient for the sobel operator are,

Gx = [-1 -2 -1; 0 0 0; 1 2 1]
Gy = [-1 0 1; -2 0 2; -1 0 1]
The sobel operator is very parallel to Prewitt operator. It is also a derivate mask and is used for edge detection. Then the sobel operator sobel operator is also used to detect two kinds of edges in an image:

- Vertical direction
- Horizontal direction

2.5 PREWIT OPERATOR

Prewitt operator is used to edge detection in an image. It consists the two types of edges

- Horizontal edges
- Vertical Edges

Edges are calculated by the corresponding pixel intensities differences in image. All the masks are used for edge detection and it also known as derivative masks. Because as we have stated many times before in this series of tutorials that image is also a signal so changes in a signal can only be calculated using differentiation. So that's why these operators are also called as derivative masks or derivative operators.

Gx=[-1 -1 -1; 0 0 0; 1 1 1]
Gy=[-1 0 1; -1 0 1; -1 0 1]

2.6 INVERSE KINEMATICS

forward kinematics is the connection between the robot joint angles, which we represent by a vector I call 'Q, and the pose of the robot end effector. This is known as the 'Inverse Kinematics Problem' that's really key to arm type of robots. *Inverse kinematics* is inferring the joint positions necessary to reach a desired end-effector pose.

Now the *robot's arm* must adjust each joint's angle in order to shift its hand over the cup. For *inverse kinematics*, there are three of them: The algebraic approach: This basically facility by solving (frankly, rather complex) matrix equations. We will start with a very simple example.
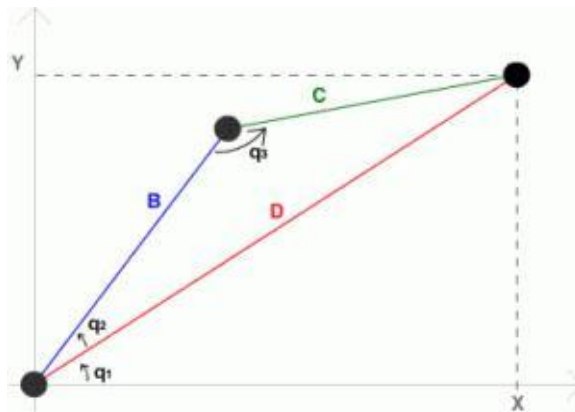
The figure above is a schematic of a simple robot lying in the X-Y plane. The robot has one joint with angle Ø and one link of length l. The place of the robot's hand is X_{hand}. The inverse kinematics problem for this robot is as follows: Given X_{hand} what is the joint angle Ø? We will start the solution to this problem by writing down the forward position equation, and then solve for Ø.

$$X_{hand} = lcosØ \quad \text{(forward position solution)}$$
$$cosØ = X_{hand}/l$$
$$Ø = cos^{-1}(X_{hand}/l)$$

To finish the result let's say that this robot's link has a length of 1 foot and we want the robot's hand to be at X = .7071 feet. That gives:

$$Ø = cos^{-1}(.7071) = +/- 45 \text{ degrees}$$

The tangent of an angle is the fraction of the length of the opposite side to the length of the adjacent side

III.RESULT AND CONCLUSION
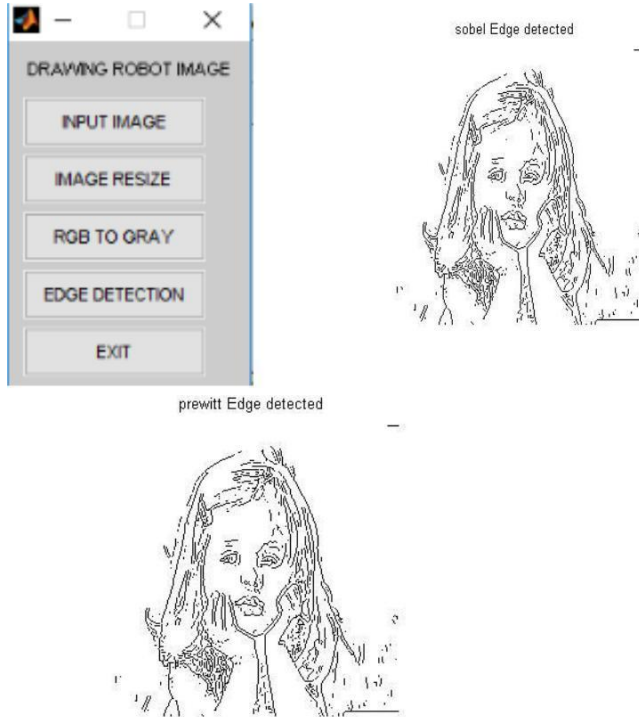
1.1 Matlab GUI   1.2 Sobel Operator   1.3 Prewitt Operator

1.4 Drawing Robot

In this paper we developed a robotic arm which can sketch human face with a 2 DOF robotic arm. Our research work will motivate the peoples about robots through an interesting behavior of robot. Our designated system has few advantages
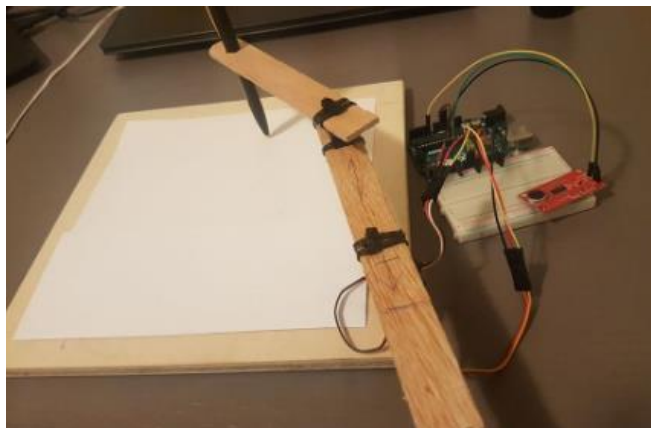such as,
• It is a cost effective, frugality of complexity and user friendly robot.
• Graphical User Interface gives user more interaction to control the robot.
• Capable of producing higher quality output
depending on efficiency of edge detection.
Our designed robot has a versatile application in
entertainment and educational purpose. It's a great fun to watch that a robot is sketching image. It's an inspiration to the general people to know about the robotic activities. Our future research is to develop the drawing quality by increasing the edge detection efficiency. Our target is to modify the current edge detection method to get finest drawing with less possible amount of edges.

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Design and Comparison of Performance Characteristics of Rectangular Slot and Square Slot Patch Antenna

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Abstract - In recent years there is a need for more compact antennas due to rapid decrease in size of personal communication devices. This paper deals with the problem of size and performance of antenna. This paper presents design and comparison of simulation of a rectangular slot patch antenna and square micro strip patch antenna at 2.6 GHz for S-Band communications that provides a radiation pattern along a wide angle of beam and achieves a good gain. The square micro strip patch antenna was analyzed using Ansoft/Ansys HFSS. The proposed inset feed patch antenna provide good Resonant Frequency, Return Loss, VSWR, Radiation Pattern and the antenna Gain.

Keywords – HFSS, VSWR

I. INTRODUCTION

Micro strip patch antennas (also just called patch antennas) are among the most common antenna types in use today, particularly in the popular frequency range of 1 to 6 GHz. This type of antenna had its first intense development in the 1970s, as communication systems became common at frequencies where its size and performance were very useful. At the same time, its flat profile and reduced weight, compared to parabolic reflectors and other antenna options, made it attractive for airborne and spacecraft applications. More recently, those same properties, with additional size reduction using high dielectric constant materials, have made patch antennas common in handsets, GPS receivers and other mass-produced wireless products. This tutorial article is intended to provide basic information on patch antenna design and operation, directed to engineers who are mainly designers of RF microwave circuits. The paper hope that this information will assist them as they design circuitry connected to these antennas, or as they are called on to evaluate and specify a vendor's antenna product for their current project.

The demand on the portable mobile devices is increasing progressively with the development of novel wireless communication techniques. In that respect, compact size, light weight, low profile and low cost are now quite important challenges to be accomplished by the designers for every wireless mobile component. Recently, there is growing research activity on multi-frequency and wideband antennas for various wireless applications such as WLAN (Wireless Local Area Network) or WiMAX (Worldwide Interoperability for Microwave Access). In particular this paper, a great interest in wideband antenna for use in wireless communication has been presented. The wideband antenna Preferred over narrow

band antennas because of the usage in various applications. A Microstrip or Patch Antenna is a low profile Antenna that has a number of advantages over other antennas it is lightweight, inexpensive, and easy to integrate with accompanying electronics. But use of Rectangular Microstrip Patch Antenna alone is very difficult because of its low gain and narrow bandwidth. So to overcome these problems an artificial material called Metamaterial is incorporates. Metamaterial are an artificial material engineered to provide properties which are not readily available in nature. We have utilized the Matamaterial Structure on the Rectangular Microstrip Patch Antenna to improve its performance.

II. MICROSTRIP PATCH ANTENNA

As communication devices become smaller due to greater integration of electronics, the antenna becomes a significantly larger part of the overall package volume. This results in a demand for similar reductions in antenna size. In order to simplify analysis and performance prediction, the patch is generally square, rectangular, circular, triangular, elliptical or some other common shape. The square micro strip patch antenna is the widely used of all the types of micro strip antennas that are present The substrate material, dimension of antenna, feeding technique will determines the performance of micro strip antenna. Hence among different feeding techniques, inset fed technique is used for the design of square micro strip patch antenna at 2.6GHz.Themicro strip patch antenna is shown in fig 2.1.Micro strip patch antenna has a ground plane on the one side of a dielectric substrate which other side has a radiating patch as shown below in Figure 2.1.
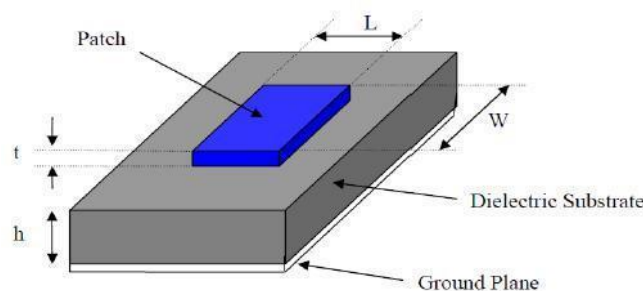

Figure 2.1 Micro strip antenna

A square patch is used as the main radiator. The patch is generally made of conducting material such as copper or gold and can take any possible shape. Dielectric constant of the substrate (r) is typically in the range 2.2< r <12. For good antenna performance, a low dielectric constant with thick dielectric substrate is desirable, as it provides better radiation, better efficiency and larger bandwidth.

2.1. Inset Feed Method

This typically yields high input impedance. Since the current is low at the ends of a half wave patch and increases in magnitude toward the center, the input impedance could be reduced if the patch was fed closer to the center. One method of doing this is by using an inset feed (a distance R from the end) as shown in the figure 2. Since the current has a sinusoidal distributions, moving in a distance R from the end will increase the current by cos (π*R/L) - this is just nothing that the wavelength is 2*L, and so the phase difference is 2*π*R/ (2*L) =π*R/L

Transmission line model depicts the micro strip antenna by two slots of width W and height h separated by transmission line of length L. The microstrip is a non-homogeneous of two dielectrics, typically, substrate and the air. Most of the electric field lines reside some part in the air and rest in the substrate. This results that transmission line does not support

transverse electric magnetic (TEM) mode of transmission, as phase velocities would be different in substrate and in the air.
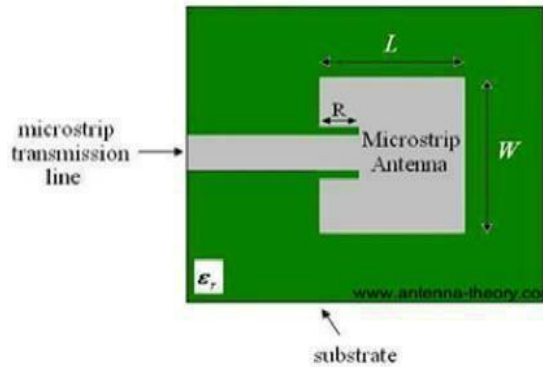
Figure 2.2 Patch antenna with insert feed

III. GEOMETRY AND DESIGN PROCEDURE

The proposed antenna based on the rectangular patch antenna which must be designed first. The antenna is planar rectangular patch antenna fed by microstrip line on the PCB (print circuit board) FR4 substrate with dielectric constant 4.4, loss tangent 0.02 and 1.6 mm of thickness (h). This antenna is design at frequency 3.188 GHz, width of microstrip is 3.009 mm for match impedance with 50 ohms of transmission line. The Rectangular Microstrip Patch Antenna is shown in figure 1. Then, the Rectangular „L" Slots are placed in ground plane in order to study its influence, and the results are compared with those of the antenna alone.

3.1 Design of Rectangular and square Microstrip Patch Antenna Inset L-Shaped Feed

Fig 3.1 Rectangular microstrip patch antenna

Fig 3.2 Square slot patch antenna

IV. Simulation Results

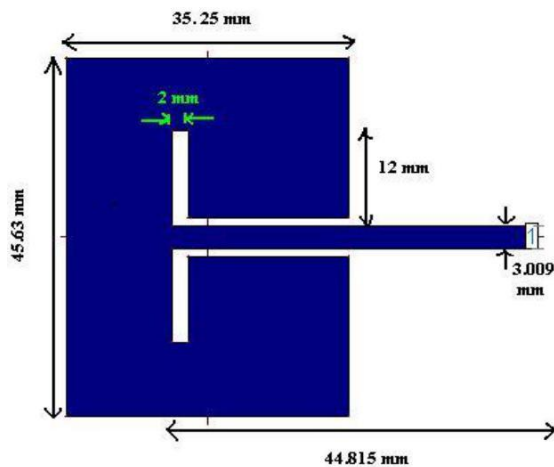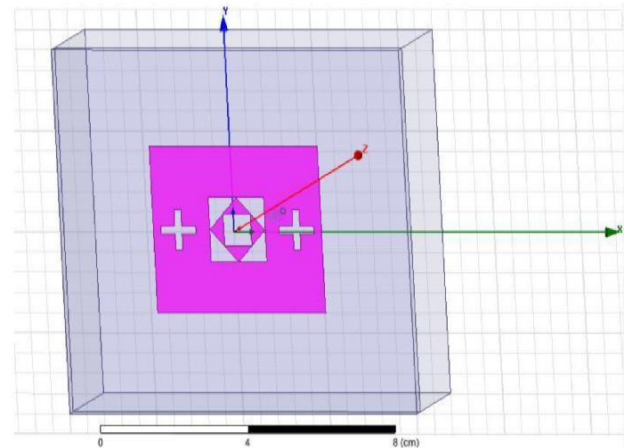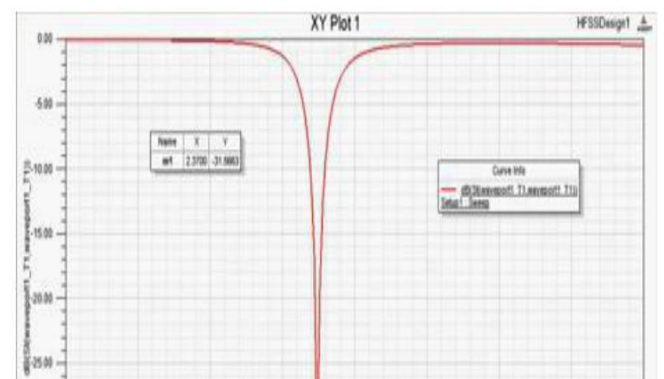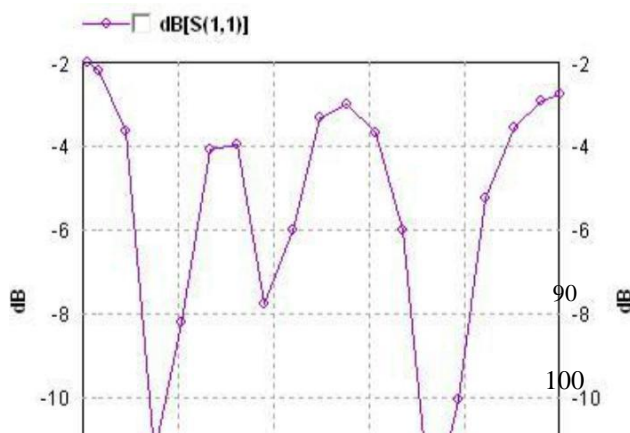**Fig 4.1. Simulation of return loss patch antenna**

Fig 4.2 Simulation of square Slot
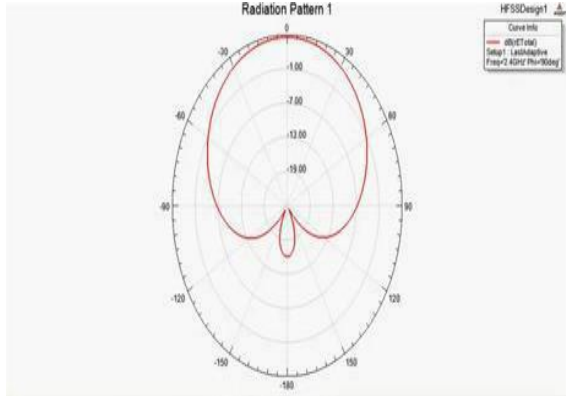
Fig 4.3 Radiation pattern of Square slot Square slot patch Patch antenna

Fig 4.4 S-Parameter of

IV. EXPERIMENTAL RESULTS

MICROSTRIP SLOT PATCH	Return Loss	Gain	VSWR
Rectangular	-23.04 dB	6.78 dB	1
Square	-23.12 dB	6.7dB	1.23

TABLE 4.1EXPERIMENTAL RESULTS ANALYSIS RECTANGULAR AND SQUARE SLOT PATCH ANTENNA

V. CONCLUSION

The design of square micro strip patch antenna and rectangular microstrip slot patch with operating frequency 2.6 GHz suitable for s band application using inset feed feeding technique has been completed using HFSS software. The performance parameters were achieved with gain 6.78 dB and beam width 40 degrees in E-plane and 26 degrees in H-plane for patch antenna. The proposed antenna consists of a single patch for single operating frequency. In future two patches are going to be stacked and slots will be introduced to operate in two operating frequency to achieve high gain and good return loss.

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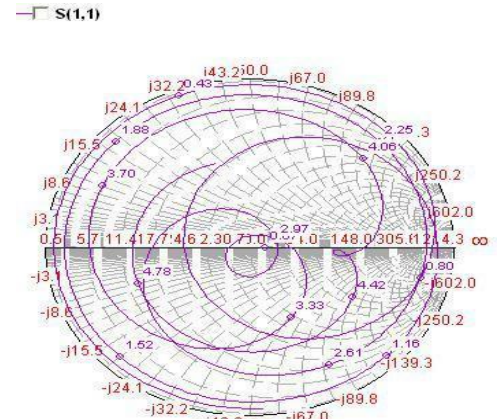4. K. F. Lee, K. M. Luk, K. F. Tong, S. M. Shum, T. Huynh, and R. Q. Lee,"Experimental and Simulation Studies of Coaxially Fed U-Slot Rectangular Patch Antenna", Inst. Elect. Eng. Proc. Microwave Antennas Propagat., vol. 144, pp.354-358,1997.

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A Smart contrivance for Women's Security

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Abstract - Women safety is necessitate of the hour now-a-days. In India, there are many cases of women pestering and molestation. Safety of women matters let be whether at home, outdoor or it be their work place. The literature surveyed shows that there are many mobile applications that are used for women safety purpose. One recent research study shows that there is a footwear chip which is sticked to the footwear that gets activated when the person taps one leg behind the other 4 times. We focus on developing a prototype that is a smart band which gets activated by tapping on the screen twice. Once the device is activated it starts sending the GPS location to the ICE contacts and police control rooms. There is a pulse rate sensor embedded in the device that senses the pulse rate of the person and a temperature sensor that senses body temperature of the person. The band when thrown with force the force sensor will get activated and sends the current location of the victim. A Piezo buzzer siren will get activated after 1-2 mins of the actual device getting turned on. The range of the buzzer is of 80-110 dB which can be heard from a distance of 50 feet long. An electric shock circuit is designed that emits electric current. On the top of the band screen there are two metal points that generates the shock when the two metal points come in contact with any surface or anybody. The device supports a micro usb charging. A smart application will be developed on the android platform which is connected with the device via bluetooth interface that shows the sensed data of the subject to the ICE contacts. Until the device is turned off it will send the location on the interval of 5 mins and will keep on beeping continuously.

Index Terms— GPS location, Piezo Buzzer Siren, Electric shock circuit, GSM module, Force sensor, Pulse rate sensor, Temperature sensor.

I. INTRODUCTION

The Internet of things [1] (IoT) is the network of physical devices, vehicles, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure. Experts estimate that the IoT will consist of about 30 billion objects by 2020. As of 2016, the vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors, and embedded system

Fig. 1. IoT Architecture.
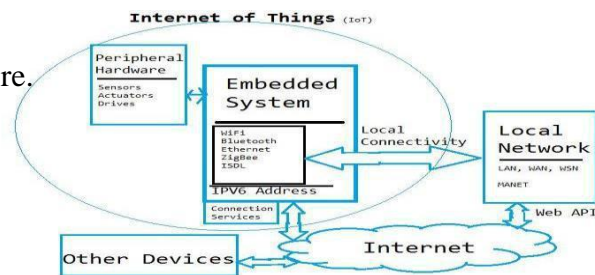
IoT is related with our research. We have made use of this new technology in our research in such a way that it helps the women or a girl while she is in trouble. It deals with hardware as well as the software. The prototype is a combination of both which makes it special.

II.EXISTING DEVICES

There are few already created devices and products in market that are related to our research. Following are the few examples of the existing systems/devices :-
• ROAR (Athena)
• Foot wear chip

• Raksha- women safety alert
• VithU:V Gumrah Initiative
• Shake2Safety

III. DRAWBACKS OF EXISTING DEVICES

There existed a chip that was sticked to the footwear and was used to send the alerts [2]. The other research showed up with the smart band that was used to generate the SOS signals along with the personal health information and based on that the alert was generated [3]. All the devices were used to sense the health parameters and positions of the body and accordingly, the alerts and SOS signals were sent to the contacts feeded [4].

IV. PROPOSED SYSTEM

We focus on developing a prototype that is a smart device that can be worn by any individual on their wrists. The band is always active; the victim needs to tap on the screen twice when she feels the need of it or she feels someone is abusing her. After tapping on the screen, the device will start sending the current latitudinal and longitudinal co-ordinates to the ICE contacts and the police control room. The device consists of a piezo buzzer that emits beep sound after 1 minute of actual activation of the device. The range of the buzzer covers up to 50 meters of radius. If the suspect tries to remove the band and throw it, the force sensors will start working and buzzer will start ringing and the location at that particular time will be sent. On the top of the band there are two nodes which will emit electric current as soon as it comes in contact with any surface after the device is activated. The current is generated with the help of leakage current. The device and the smart phone are connected using Bluetooth, which is responsible for the overall data sharing and connectivity. The heart of the device is Arduino which controls the entire device prototype. OLED screen is used as the UI for the device. A captative touch is used for carrying out the touch functionality of the screen. It is attached on the OLED screen.

• Arduino: Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple micro-controller board, and a development environment for

writing software for the board. In our project we are going to use Arduino Uno. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the micro-controller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

•   Bluetooth Module: Bluetooth is a specification for a small form-factor, low-cost radio solution providing links between mobile computers, mobile phones and other portable handheld devices, and connectivity to the Internet. It will enable users to connect a wide range of computing and telecommunications devices easily and simply, without the need to buy, carry, or connect cables. We are using Bluetooth Module for connecting our device with mobile.
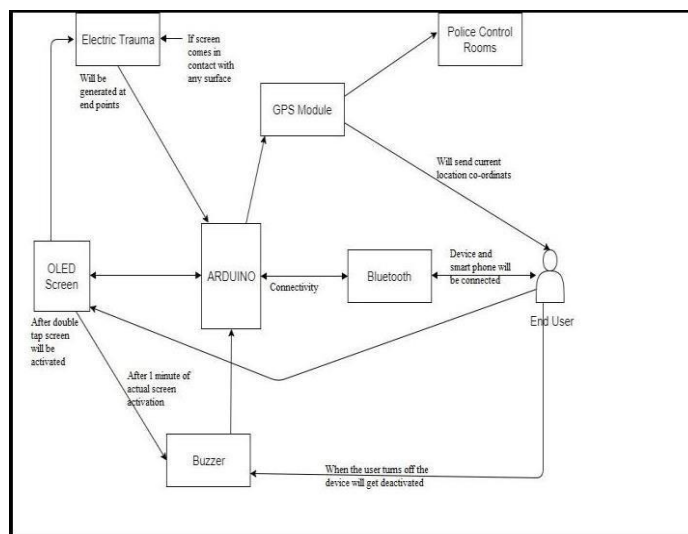
Fig. 2. System Architecture

• Relay: A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of a person moving the switch. It takes a relatively small amount of power to turn on a relay but the relay can control something that draws much more power. Relays are used in our project for generating shock for the device.

• Buzzer: The buzzer produces sound based on reverse of the piezoelectric effect. The generation of pressure variation or strain by the application of electric potential across a piezoelectric material is the underlying principle. These buzzers can be used alert a user of an event corresponding to a switching action, counter signal or sensor input. They are also used in alarm circuits. The purpose of using buzzer is for alerting the suspect sand gathering people for help.

Following is the working of the system:

1) Mobile app need to connect with hardware circuit via bluetooth module.
2) In emergency situation women can double tap on captivative touch attached to the screen. This will activate the shocker circuit through the relay.
3) Buzzer is used as alarm to generate beep sound in both the conditions.
4) The bluetooth module is used to send signal to mobile when in danger situation.
5) Mobile will send SMS to predefined number with location using android app (these numbers will be stored in mobile app).
6) GPS is used to track live location and hence GPS of the phone needs to be kept ON.
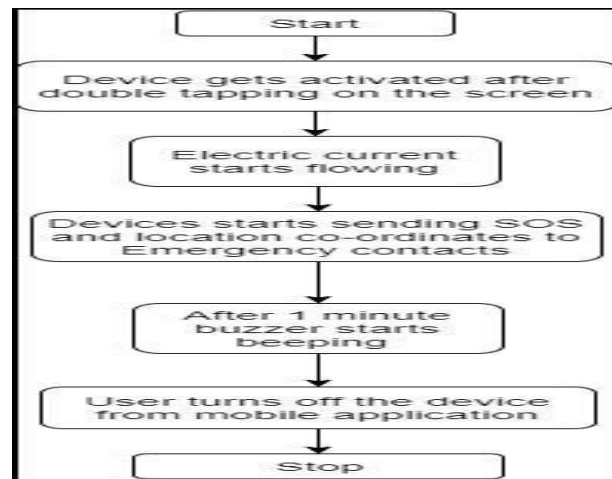
Fig. 3. System Flow

V. CONCLUSION AND FUTURE WORK

Supportive device with smart system has been used to converse if attacked. There are highest chances to reduced crime by this system. Shock preventive tools are used for anticipation of event, alarm bell used for notifying will be supportive methods to alert the hostility. Message through GPS and GSM technology is the additional part to help the individual. For immediate action against the criminal, video processing information can be used. Fear or anger of user has to be considered by using Camera application in future which will generate the message to the control room and an alarm will be activated. The system can perform the real time monitoring of desired area and detect the violence with a good accuracy.

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Design of security system for vehicles

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Abstract:

A smart security system is a special idea which makes motorcycle driving safer than before. This is implemented using GSM and GPS technology. Many times we hear the cases of bikes getting stolen from parking area or sometimes we forgot to remove the keys from bike by mistake. In these cases it is really difficult to get the bike back. This paper proposes a design to solve this purpose. This system provides two stage security systems. The main concept behind this project is of a bike security system using a password entered through keypad. This system turns on the Buzzer when wrong password is entered for 3 times. User can change this password anytime he/she wish using a keypad. If the rider wears the helmet then only the bike will be turned on. The working of this smart helmet is very simple, vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense and gives to the microcontroller board, then controller extract GPS data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family member. The RF is used for starting the two wheeler first it checks whether the driver is drunken end or not if drunken it will not allow him to start the two wheeler. Here a circuit which detects when a call is incoming in a mobile phone by means of a flashing LED. It can detect even when the calling mobile phone and the engine will be automatically turned off.

Keyword: **Alcohol Sensor, GSM, GPS, Microcontroller, Pressure Sensor, Smart helmet, Vibration Sensor.**

I. INTRODUCTION

The thought of developing this project comes to do some good things to the society. Day by day the two wheeler accidents are increasing and leads to loss of many lives. According to a survey of India there are around 698 accidents occurring due to bike crashes per year. The reasons may be many such as no proper driving knowledge, no fitness of the bike, fast riding of bike, drunken and drive and s o o n Sometime the person injured, the accident may not b e directly responsible for the accident, it may be fault of rider, but at the end it's both the drivers involved in the accidents who is going to suffer. If accidents are one issue, lack of treatment in proper time is another reason for deaths.

According to the survey India 698 accidents occur per year, nearly half the injured people die due to lack of treatment in proper time. There are many reasons for this, such as late arrival of ambulance, no persons at place where the accident occurred to give information to the ambulance or parents.
This is a situation we observe in our day to day life, a thought of finding some solution to

resolve this problem come up with this idea of giving the information about accident as soon as possible and in TIME….!!!! Because after all time matter is a lot, if everything is done in time, at least we can save half the lives that are lost due to bike accidents.

We can avoid two wheeler accidents by considering three cases such as I. Make wearing the helmet compulsory. II. Avoid drunk and drive. III. If person met with an accident, no one is there to help him. Simply leaving or ignoring the person he may die. In such situation, informing to ambulance or family members through mobile to rescue him for an extent.

II. BLOCK DIAGRAM
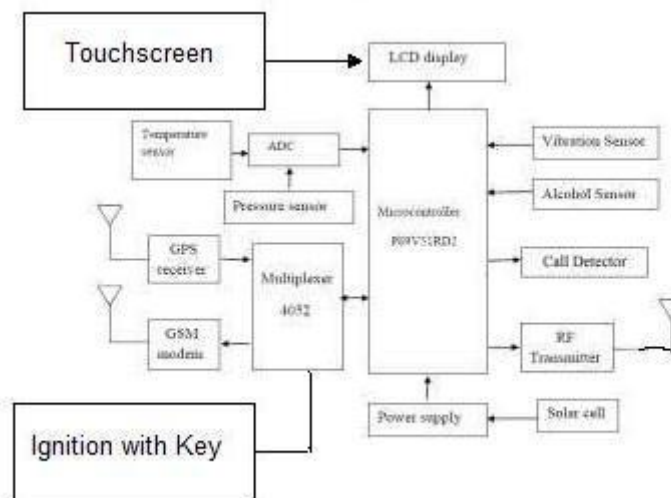
Fig: 1.1 Block Diagram of Smart Helmet

2.1 Alcohol Detector

In this system P89V51RD2 microcontroller is used. When the system is switched on, LED will be ON indicating that power is supplied to the circuit. The RF is used for start the two wheeler firstly it checks whether the driver is drunken end or not if drunken it will not allow starting two wheelers

2.2 Accident detector

To run the GPS and GSM module, microcontroller is a very user friendly device which can be easily i n t e r f a c e d with any sensors or modules and is very compact in size.Now some of the thoughts in our mind, how will send the SMS using the GSM module by keeping the GPS location in the SMS which is obtained from the GPS module. But when should all this is done? When accident occurs, how will the microcontroller detect the accident? This can be done by using a vibration sensor which is placed in the helmet.

Fig: 1.3 No alcohol display

The vibration sensor is placed in the helmet such that it detects vibrations of the helmet. When the rider crashes, the helmet hits the ground and the vibration sensor detects the vibrations that are created when the helmet hits the ground and then the microcontroller detect the accident occurrence and it will send an SMS containing information about the accident and location of accident using GSM and GPS modules. Alcohol sensor sense the alcoholic content whether the rider drunken or not, if he drunken bike will not start showing as alcohol detected on LCD display. Use of pressure sensor, gives the whether the rider wear the helmet or not. If he not wears the helmet

Fig: 1.3 LCD display

Software required is keil's software for run the code and to dump the code into controller using flash magic. Using assembly language to write the code for the system.

2.3 ADC0809

ADC0809 is an 8-bit analog to digital converter. It is used to convert the analog voltage of temperature sensor and battery circuit. The reference voltage of ADC0809 is 5V. It is an 8 channel ADC[12]. The temperature sensor is connected to channel 0 and battery circuit is connected to channel 1.

Fig: 1.5 Atmega328 Pinout
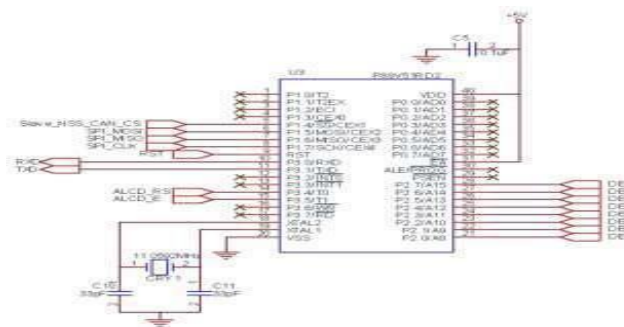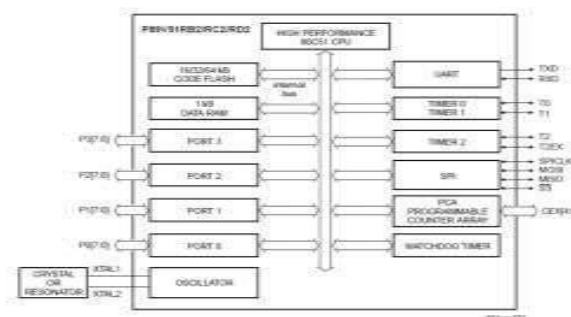

Fig: 2.1 Atmega328 Architecture

The 8-bit A/D converter uses successive approximation as the conversion technique. The converter features a high impedance chopper stabilized comparator, a 256R voltage divider with analog switch tree and a successive approximation register. The 8- channel multiplexer can directly access any of 8-single-ended analog signals.

2.4 Vibration Sensor

This sensor buffers a piezoelectric transducer. As the transducer is displaced from the mechanical neutral axis, bending creates strain within the piezoelectric element and generates voltages.

2.5 Hardware Software Description

The P89V51RD2 are 80C51 microcontrollers with 64kB flash and 1024 bytes of data RAM. A key feature of the P89V51RD2 is its X2 mode option. The design engineer can choose to run the application with the conventional 80C51 clock rate (12 clocks per machine cycle) or select the X2 mode (six clocks per machine cycle) to achieve twice the throughput at the same clock frequency. The flash program memory supports both parallel programming and in serial ISP. Parallel programming mode offers gang-programming at high speed, reducing programming costs and time to market. ISP allows a device to be reprogrammed in end product under software control.

2.6 LCD display

When Vibration Sensor Alarm recognizes movement or vibration, it sends a signal to either control panel Developed a new type of Omni- directional high sensitivity Security Vibration Detector with Omni-directional detection.

Fig: 2.2 Information Display

2.7 GSM Modem SIM 300

Designed for global market, SIM300 is a Tri-band GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS1900 MHz SIM300 provides GPRS multi-slot class10 capability and support the GPRS[8] coding schemes CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 40mm x 33mm x 2.85 mm, SIM300 can fit almost all the space requirement in your application, such as Smart phone, PDA phone and other mobile device
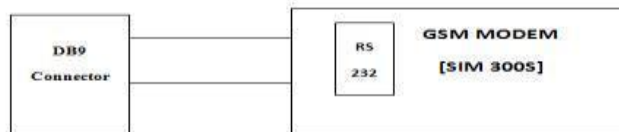
Fig: 2.3 GSM Communications

2.8 EMS (Enhanced Messaging Service)

Besides the data size limitation, SMS has another major drawback -- an SMS message cannot include rich-media content such as pictures, is the abbreviation for European Telecommunications Standards Institute. Now the 3GPP(Third Generation animations and melodies. EMS (Enhanced Messaging Service) was developed in response to this. It is an application-level extension of SMS. An EMS message can include pictures, animations and melodies. Also, the formatting of the text inside an EMS message is changeable. For example, the message sender can specify whether the text in an EMS message should be displayed in bold or italic, with a large font or a small font.

2.9PENALIZATION

Here the schematic transformed in to the working positive/negative films. The circuit is repeated conveniently to accommodate economically as many circuits as possible in a panel, which can be operated in every sequel of subsequent steps in the PCB process. This is called penalization. For the PTH boards, the next operation is drilling.

2.10 Call detector

Here a circuit which detects when a call is incoming in a mobile phone by means of a flashing LED. It can detect even when the calling mobile phone, so that its sensor or coil L1 can detect the field emitted by the phone receive during an incoming call working[17]. The sensor coil L1 detects the signal and the detected signal is amplified by transistor Q1 and drives the mono stable input pin of ICI. The IC's output

A commercial 10mH miniature inductor, usually sold in the form of a tiny rectangular plastic box, can be used satisfactorily but with lower sensitivity. ICI must be a CMOS type; only these devices can safely operate at 1.5V supply or less.

Results

Fig: 2.4 Circuit Diagram

Fig: 2.5. Emergency information Display

Features:

This system is cost effective, so we can implement easily.

It must be implemented in all driven system.

It is more effective.

III. CONCLUSION

As the concluding part of this project, I would like to say that-- "Without proper action at proper time, danger awaits us with a bigger face." We must act on time when a person is injured. We must take care of person the way it is meant. Otherwise, a valuable life might be lost. We need to understand how precious lives of people are and what importance first-aid carries in saving these precious lives. This may useful to each and every person in day to day life and they will never afraid of the vehicle thefters. By this project people come to existence that our country is developing and they move forward the leg with full of dareness in their minds.

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A Language Teaching Ability for Deaf and Dumb Using Wireless Technology

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Abstract—With the rise of usage in digital content in education, deaf and blind communities face communication barriers which as a result makes education less inclusive. These barriers do not allow them to integrate within the larger scholarly communities as most tools used for information dissemination remain inaccessible to them. This paper presents BDC-API (Blind/Deaf Communications API), a free-to-use modular toolkit that will ease accessibility for the blind and deaf communities to digital education content. This content includes the use cases of Massive Online Open Courses and Serious Games used in education. BDC-API incorporates the use of state of the art technologies such as, 3D sign language translator, grammar translation, voice recognition and text-to-speech. This paper demonstrates in greater detail, how these technologies culminate in the creation of an API ready to use for any educational digital content and how the BDC-API can ensure higher quality of digital content.

Keywords—BDC-API; blind; deaf; communication; education; sign language; voice recognition; text-to-speech;

I.INTRODUCTION

Since 1986, it is estimated that 80% of school learning is dependent on visual material and consequently, a visual impairment constitutes a communication handicap and thus a barrier to education [1]. Similarly, people with auditory impairments, cannot use any auditory queues to navigate but must instead rely on visual guidance to navigate anything digital. In fact, some may find it surprising that the deaf have trouble interfacing with technology as it relies mainly on visual cues. These difficulties arise due the fact that Sign Language has its own grammar and its practitioners cannot read written language in the same way i.e. they have their own grammar and punctuation for written scripts, making it hard for them to understand text as we know it [1].

It is, hence, of little surprise that the blind and deaf communities face a communication challenge when interfacing with the digital. As the people who are visually impaired cannot interface with most digital content, they rely on auditory cues and guidance to navigate it. Hence, given the vast amount of solutions that are implemented digitally, and the diversity of these solutions and their respective interfaces, using automatic tools to assist the fluid communication between people using different languages and different

channels of communication seems to be the most viable solution that would significantly promote the social inclusion of disabled students.

II.STATE OF THE ART

A. Voice Recogntion

The automatic voice recognition consists in mapping a acoustic signal captured by a transductor normally a microphone into a set of words [3], [4]. Most voice recognition systems use dictionaries as these have the pronunciation of words, this model also contains a sequence of units of words with acoustic models that cover each word of the vocabulary [5].

In the current days there are the following voice recognition engines: Dragon Naturally Speaking, mobile systems, Simon, Audimus, SpeechMagic, Skype Translato, iSpeech, Microsoft Speech Platform SDK 11 and Web Speech API [6].

All of the above-mentioned voice recognition software were considered. We will quickly break down the reason for our choices:

- Dragon Naturally Speaking: developed by Nuance, all versions of this software are paid and supports only English, French, German, Spanish and Italian [3]. Discarded due to budget constraints.

- Each mobile system's (Android, iOS and Windows Phone) native voice recognition: the choice of platform defines the development process, each system would not be able to handle all use-cases, given that not all people use the same platform [3]. Discarded due to lack of portability.

- Simon: free program for voice recognition, can implement self-created speech models; Simon only possesses speech models for English, German and Brazilian Portuguese. Discarded due to lack of resources to create Speech Models for European Portuguese [3].

- Audimus: transcribes any audio, speech and video content in European Portuguese, however, is a paid program [3]. Discarded due to budget constraints.

- Julius: very similar to Simon, its usage requires preparation of acoustic and linguistic models for European Portuguese. Hence for the same reason, Discarded due to lack of resources to create Speech Models [3].

From the speech engines analyzed only two can be used the project: Microsoft Speech Platform SDK 11 or Web Speech AP. Given this work's inclusive character, it was opted to use Web Speech API. The Web Speech API achieved a greater usability and portability since the voice recognition analysis only requires the device to have Internet connectivity and to use Google Chrome. The disadvantage is that the system can only use the voice recognition for 60 seconds straight [3]. Attending to the fact that voice recognition performance for the Web Speech API are unknown for all languages, including European Portuguese, it was decided to conduct a small test in order to obtain an idea of the voice recognition capabilities of this tool [3]. To determine the efficiency of the Web Speech API for European Portuguese the following steps were taken:

1. Definition of text phrases;
2. Recording of audio files (.flac);
3. Usage of an algorithm in order to send audio to files to the google server to show the voice recognition results;
4. Evaluation of the results.

The recordings were done by 6 volunteers: 3 females and 3 males in the age range of 24 to 60 years old. Each speaker record 10 phrases spoken at 3 different rhythms (slow, normal and fast) resulting in 30 files for each speaker and 180 files in total [3].

The Web Speech API in European Portuguese offered the best results in the phrase and words level when used in a slow speech in comparison to the results obtained in English; with normal speech speed, the system guaranteed an efficiency similar on the phrase and word level when compared to English; with fast

speech speed, the system offered results similar in the phrase level in comparison to English and worse results in the word level in comparison with to the English language [3].

So, the Web Speech API (slow speech) offers in the phrase and word levels an efficiency of 50% and 77.55% respectively

B.Sign Language Translator

Although some of the auditory impaired populace can read text fluently, they are a minority. Deaf students' mother language is sign language with its proper grammar quite distinct from oral language [2].

In sign language they use sentences only word by word while filtering out some elements of the speech, e.g. articles. The order of these also follows its own structure, for example, having the subject and then object, finally, followed by the verb, often having the time and location referenced at the beginning of a sentence. It is hard for the deaf to understand an oral language grammar since it is different and more complex than sign language's grammar. This fact, together with the lack of communication via sign language in schools, severely compromises the development of linguistic, emotional and social skills in deaf students [2].

The LGP is the sign language used by the deaf Portuguese community that was recognized as one of the official languages of Portugal in 1997.

There are several programs that allow for the translation of text to sign language. ProDeaf, Showleap, Motionsayvy, Spreadthesign, Sagawa, Akmeliawati, Chai, Mohandes and VirtualSign technologies and projects were considered [2]. A state of the art on these technologies can be seen on ACE paper [2].

Considering related past research projects, ACE has scientific information and results to infer a stable architecture to formalize the complex data of multiple sign languages and other communications types [2].

III.DEVELOPMENT PLATFORMS AND SERIOUS GAMES

Choosing a development platform is crucial to how scalable, viable, complex as well as, maintainable any project can be. For this reason, we decided to use a well-documented and well-maintained development platform. Given this criterion, as well as the necessity for a graphics ready platform, it was quickly surmised that game development platforms would provide ideal performance in performance-intensive situations, most specifically in the case of our proof of concept: Serious Games.

Unity on the other hand is a free-to-use game engine maintained by Unity Technologies. Unity has libraries of content available to developers through the asset store as well as an impressive community, given that it was one of the first free-to-use game engines. Unity allows for easy manipulation of graphical content through the engine itself or though C# scripting.

In the case of blind people, text-based, role playing, and strategy video games tend to be the preferred types. The principle characteristic of this types of games is the slow pace, and a game mechanic that could be used to handle the rhythm of the game is turns, this allows the user to have the time he needs for answer and communication [2]. With this in mind, the BDC-API had to be created in a manner that could handle multiple forms of inputs seamlessly.

IV.BDC-APIARCHITECTURE

The ACE architecture [2], was used as the backbone for the creation of the BDC-API (Blind/Deaf Communications API). The BDC-API was created with the education professionals with little technical and/or coding experience in mind, such that teachers with no knowledge of how the API was created could easily implement it in their own educational courses, making the digital educational tools that were once more difficult to access for the Blind/Deaf communities much more accessible. Due to the complexity of the Blind/Deaf languages and syntactic structure, the BDC-API was created in close relation with experts in Sign Language as well as Blind Digital Content users – tailoring the solution to their needs.

In order to test its potential, the BDC-API was first integrated into Microsoft Powerpoint as a plug-in. The plug-in allows for real-time translation of the text on the slide into Sign Language, made possible through the screen capture of the 3D avatar. The real-time translation of the text on the Powerpoint slides is made possible through a grammar engine to parse, understand and formulate the text in a manner appropriate for

sign language to be acted out by the avatar. This application was deemed to be especially useful in the Massive Online Open Course (MOOC) and Classroom context as online and offline lectures often take the form of some slide-based information sharing – oftentimes PowerPoint [9].
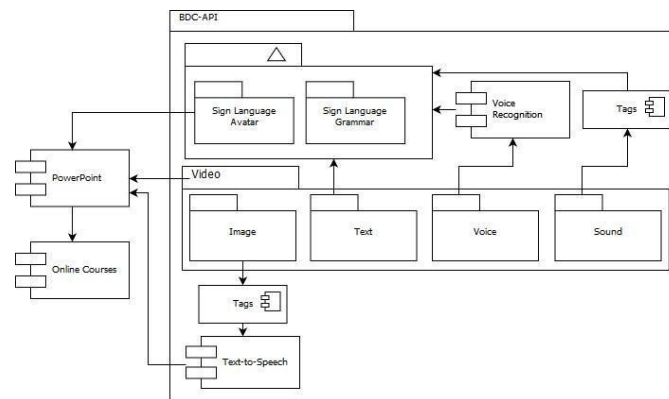

Fig. 1.BDC-API translation modules for educational content

Blind students can use this digital content by being able to listen to the original voice, however misses images and other visual inputs, those can be tagged and converted to text, which then is converted back to voice or sound, enabling the blind student to fully experience the whole content. Deaf students can use this digital content which has the avatar supporting it, by converting voice and sound to the sign language translator which uses sign language grammar. Sign language grammar is needed as the deaf despite being able to read, has an easier time understand when it is tailored to his natural language. The sign language is validated in database by sign language experts, this content is request by sign language grammar engine which converts written text to their grammar. This database contains all sign language gestures in all languages as well their context and hand configurations.

V.TECHNOLGIES READY FOR IMPLEMENTATION IN BDC-API

As previously stated, one of the core values that were used in developing the BDC-API was modularity. Modularity allows simultaneously a flexibility to the program in the tasks it can undertake as well as allowing it to remain at the forefront of the state of the art. As such, the following technologies are ready for implementation within the API, or where the API can be easily implemented.

A.IBM Watson

The IBM Watson API is an application developed by IBM with several services, notably, voice recognition and speech synthesis. It allows the same functionalities as the Web Speech API previously described in the section 3.3.5. It has an SDK for Unity, meaning that the source code is available for editing and since it uses its own server for the voice recognition and speech synthesis, it should be capable of working on any platform. However, due to the implementation the SDK used, only Windows is supported in Unity using these functionalities, also the overall performance is worse than the Web Speech API, it has a limit on free usage and does not provide as many languages as the Web Speech API. However, depending on Development Needs, can be implemented in the BDC-API instead of Web Speech.

B.Web Speech API

The Web Speech API is a functionality that was added to Google Chrome browser and other browsers only support it partially. It allows voice recognition and speech synthesis in web apps, making it possible to use voice as an input, to use voice commands and text-to-speech translating. This is also a key feature in the project model architecture, since it enables the interaction with the blind people using voice commands and speech synthesis to provide the feedback they need. It is the default implementation of text-to-speech used within the BDC-API.

C.Virtual Sign Language Translator

The Virtual Sign Language Translator is an application developed in the GILT laboratory which is able to translate text into sign language using a 3D model avatar, this is included in the BDC-API by default.

VI. DISCUSSION

As the BDC-API has only shortly been completed to a satisfactory level, we have yet to fully test the solutions with both Blind or Deaf audiences. However, for the tests, we plan on using Quantitative Evaluation Framework (QEF) to obtain evaluation. Below are the questions we hope to ask in order to evaluate the performance of the API:

Questions for the visually impaired sample:

Question	Answer
Was it clear when the voice recognition was not working?	Yes / No
Was it clear when the voice recognition was not able to recognize the spoken speech command?	Yes / No
Was the speech synthesis understandable?	Yes / No
Was the information given enough?	Yes / No
Was the information clear?	Yes / No
Was the communication with the video game interactive?	Yes / No
Did the video game possessed linguistic errors?	Yes / No
Was the game fun?	Yes / No
Would you play again?	Yes / No
Were the test conditions comfortable?	Yes / No

Questions for the auditoryimpaired sample

Question	Answer
Was the sign language translation understandable?	Yes / No
Was the sign language translation correct?	Yes / No
Was the information given enough?	Yes / No
Was the information clear?	Yes / No
Was the communication with the video game interactive?	Yes / No
Did the video game possessed linguistic errors?	Yes / No
Was the game fun?	Yes / No
Would you play again?	Yes / No
Were the test conditions comfortable?	Yes / No

These questions will allow us to quantifiably see the performance of the API based on the proportion of affirmative to negative responses. During in lab testing, the results were satisfactory for the API when implemented in a small game made for the purpose – Tic-Tac-Toe. We hope to test the BDC Tic-Tac-Toe with a proper sample size and the following questions shortly.

VII. CONCLUSION

The BDC-API allows to solve the problem of inclusive access to digital content, having a flexibility that allows it to adapt to new technologies as they come, in order to scale into the future and adapt to more digital content types.

Through BDC-API feedback and international surveys it was discovered that the deaf are tolerant to grammatical errors and that grammatical rules in different sign languages are almost the same despite looking very different due having different word orders. These word orders are easy to change by code and then with some generic rules common to all sign languages they can read with their own grammar. Grammatical rules used were divided in three separate groups: add grammar, change grammar and remove grammar. Remove grammar is to remove articles, some auxiliaries and prepositions. Change grammar is changing the grammar according to the user word order, converting verbs to infinitive and moving the local and time adverbs to the begging of the sentence with some tags for body language.

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Chebyshev Polynomial Approximation for Distributed Signal Processing

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Abstract—Unions of graph Fourier multipliers are an impor-tant class of linear operators for processing signals defined on graphs. We present a novel method to efficiently distribute the application of these operators to the high-dimensional signals collected by sensor networks. The proposed method features approximations of the graph Fourier multipliers by shifted Chebyshev polynomials, whose recurrence relations make them readily amenable to distributed computation. We demonstrate how the proposed method can be used in a distributed denoising task, and show that the communication requirements of the method scale gracefully with the size of the network.

Index Terms—Chebyshev polynomial approximation, denois-ing, distributed optimization, regularization, signal processing on graphs, spectral graph theory, wireless sensor networks

I.INTRODUCTION

Wireless sensor networks are now prevalent in applications such as environmental monitoring, target tracking, surveil-lance, medical diagnostics, and manufacturing process flow. The sensor nodes are often deployed en masse to collectively achieve tasks such as estimation, detection, classification, and localization. While such networks have the ability to collect large amounts of data in a short time, they also face a number of resource constraints. First, they are energy constrained, as they are often expected to operate for long periods of time without human intervention, despite being powered by batteries or energy harvesting. Second, they may have limited communication range and capacity due to the need to save energy. Third, they may have limited on-board processing capabilities. Therefore, it is critical to develop distributed algorithms for in-network data processing that help balance the trade-offs between performance, communication bandwidth, and computational complexity.

Due to the limited communication range of wireless sensor nodes, each sensor node in a large network is likely to communicate with only a small number of other nodes in the network. To model the communication patterns, we can write down a graph with each vertex corresponding to a sensor node and each edge corresponding to a pair of nodes that communicate. Moreover, because the communication graph is a function of the distances between nodes, it often captures spatial correlations between sensors' observations as well.

That is, if two sensors are close enough to communicate, their observations are more likely to be correlated. We can further

specify these spatial correlations by adding weights to the edges of the graph, with higher weights associated to edges connecting sensors with closely correlated observations. For example, it is common to construct the graph with a thresholded Gaussian kernel weighting function based on the physical distance between nodes, where the weight of edge e connecting nodes i and j that are a distance d(i; j) apart is for some parameters.

II. DISTRIBUTED SIGNAL PROCESSING

In this paper, we consider signals collected by a sensor network whose nodes can only send messages to their local neighbors (i.e., they cannot communicate directly with a central entity). While much of the literature on distributed signal processing (see, e.g., [1]-[4] and references therein) focuses on coming to an agreement on simple features of the observed signal (e.g., consensus averaging, parameter estima-tion), we are more interested in processing the full function in a distributed manner, with each node having its own objective. Some example tasks under this umbrella include:

Distributed denoising – In a sensor network of N sensors, a noisy N-dimensional signal is observed, with each component of the signal corresponding to the observation at one sensor location. Using the prior knowledge that the denoised signal should be smooth or piecewise smooth with respect to the underlying weighted graph structure, the sensors' task is to denoise each of their components of the signal by iteratively passing messages to their local neighbors and performing computations.

Distributed semi-supervised learning / binary classifica-tion – A binary label (-1 or 1) is associated with each sensor node; however, only a small number of nodes in the network have knowledge of their labels. The cooperative task is for each node to learn its label by iteratively passing messages to its local neighbors and performing computation

II.SPECTRAL GRAPH THEORY

Before proceeding, we introduce some basic notations and definitions from spectral graph theory . We model the sensor network with an undirected, weighted graph G = fE; V; wg, which consists of a set of vertices V , a set of edges E, and a weight function w : E ! R^{+} that assigns a non-negative weight to each edge. We assume the number of sensors in the network, N = jV j, is finite, and the graph is connected.

Cheeger constant

The Cheeger constant (also Cheeger number or isoperimetric number) of a graph is a numerical measure of whether or not a graph has a "bottleneck". The Cheeger constant as a measure of "bottleneckedness" is of great interest in many areas: for example, constructing well-connected networks of computers, card shuffling, and low-dimensional topology (in particular, the study of hyperbolic 3-manifolds).

More formally, the Cheeger constant $h(G)$ of a graph G on n vertices is defined as

$$h(G) = \min_{0 < |S| \le \frac{n}{2}} \frac{|\partial(S)|}{|S|},$$

where the minimum is over all nonempty sets S of at most $n/2$ vertices and $\partial(S)$ is the *edge boundary* of S, i.e., the set of edges with exactly one endpoint in S.[8]

Cheeger inequality

When the graph G is d-regular, there is a relationship between $h(G)$ and the spectral gap $d - \lambda_2$ of G. An inequality due to Dodziuk[9] and independently Alon and Milman states that

$$\tfrac{1}{2}(d - \lambda_2) \le h(G) \le \sqrt{2d(d - \lambda_2)}.$$

This inequality is closely related to the Cheeger bound for Markov chains and can be seen as a discrete version of Cheeger's inequality in Riemannian geometry.

III. DISTRIBUTED COMPUTATION

We now turn to the issue of how to implement the above al-gorithm in a distributed fashion by sending messages between neighbors in the network. One option would be to use the distributed lasso algorithm of [19], which is a special case of the Alternating Direction Method of Multipliers [31, p. 253]. In every iteration of that algorithm, each node transmits its current estimate of all the wavelet coefficients to its localneighbors. With a transform the size of the spectral graph wavelet transform, this requires 2|E| total messages at every iteration, with each message being a vector of length N(J+1).A method where the amount of communicated information does not grow with N (beyond the number of edges, |E|) would be highly preferable.

The Chebyshev polynomial approximation of the spectral graph wavelet transform allows us to accomplish this goal. Our approach is to approximate W by $\tilde{W}$, and use the distributed implementation of the approximate wavelet transform and its adjoint to perform iterative soft thresholding. In the first softthresholding iteration, each node n must learn $(\tilde{W}y)(j-1)N+n$ at all scales j, via Algorithm 1. These coefficients are then stored for future iterations. In the kth iteration, each node n must learn the J + 1 coefficients of $\tilde{W}\tilde{W}^*a^{(k-1)}$ centered at n, by sequentially applying the operators $\tilde{W}^*$ and $\tilde{W}$ in adistributed manner via the methods of Sections IV-B and IV-A, respectively. Finally, when a stopping criterion for the soft thresholding is satisfied, the adjoint operator $\tilde{W}^*$ is applied again in a distributed manner to the resulting coefficients a^*, and node n's denoised estimate of its signal is $\tilde{W}^*a^*n$

.

Original Signal (a)

Noise (b)

Noisy Signal (c)

Denoised Signal (d)
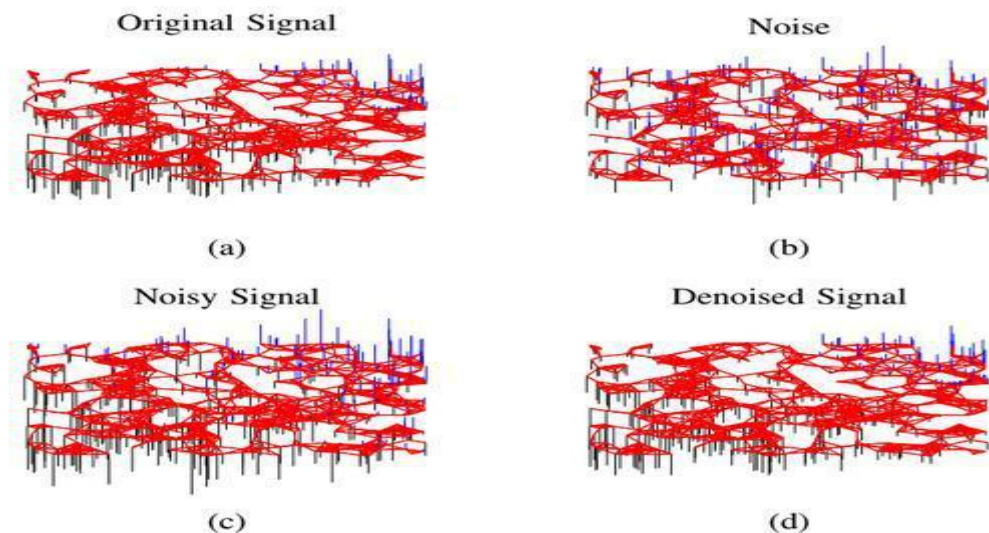
IV. CONCLUDING REMARKS AND FUTURE WORK

We presented a novel method to distribute a class of linear operators called unions of graph Fourier multiplier operators. The main idea is to approximate the graph Fourier multipliers by Chebyshev polynomials, whose recurrence relations make them readily amenable to distributed computation in a sensor network. Key takeaways from the discussion and application examples include:

➢ A number of distributed signal processing tasks can be represented as distributed applications of unions of graph Fourier multiplier operators (and their adjoints) to signals on weighted graphs. Examples include distributed smoothing, denoising, and semi-supervised learning.

➢ The graph Fourier multiplier operators are the graph ana-log of filter banks, as they reshape functions' frequencies through multiplication in the Fourier domain.

➢ The amount of communication required to perform the distributed computations only scales with the size of the network through the number of edges of the communication graph, which is usually sparse. Therefore, the method is well suited to large-scale sensor networks.

Our ongoing work includes extending the scope and depth of our application examples. In addition to considering more applications and larger size networks, we plan a more thorough empirical comparison of the computation and communication requirements of the approach described in this paper to al-ternative distributed optimization methods. The second major line of ongoing work is to analyze robustness issues that arise in real networks. For instance, we would like to incorporate quantization and communication noise into the sensor network model, in order to see how these propagate when using the Chebyshev polynomial approximation approach to distributed signal processing tasks. It is also important to analyze the effects of a sensor node dropping out of the network or communicating nodes losing synchronicity to ensure that the proposed method is stable to these disturbances.

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FPGA implementation of OFDM transceiver using NTT and INTT algorithm

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ABSTRACT- In the recent technology of digital communication system, where as multiple carrier signals are used to transmit and receive the data, in the application of Orthogonal frequency division Multiplexing (OFDM). In an OFDM method of digital signal processing application will not support large integer values in all arithmetic operations. The use of Fully Homomorphic encryption algorithm to allows a computation in large integer multiplication, addition and division to be carried out directly on cipher texts for ensuring data privacy on un-trusted servers, thus attracting much attention for cloud computing applications. In this paper, we are focusing on the design and implementation on OFDM with using Large integer multiplication with using NTT (Number theoretic transform) and INTT (Inverse Number Theoretic transform). This fully homomorphic encryption method will have various efficient schemes to tackle and carrying out large integer multiplication based on Schönhage–Strassen algorithm (SSA). The Number Theoretic Transform (NTT) provides efficient algorithms for cyclic and mega-cyclic convolutions, which have many applications in computer arithmetic, e.g., for multiplying large integers and large degree polynomials. This proposed method will design in VHDL language and synthesized in Xilinx ,finally compared with existing OFDM Technique of FFT and IFFT Method and shown the compared terms of Area, Power and delay.

Key words: **OFDM,NTT,INTT,VHDL language,Xilinx.**

I. INTRODUCTION

OFDM is method of digital signal modulation in which a single data stream is split across several separate narrowband channels at different frequencies to reduce interference and crosstalk. OFDM is a technique used in modern broadband Wireless communications systems to mitigate the effect of dispersive channel distortion. In high data rate OFDM system, cyclic prefix is introduced to eliminate inter – symbol interference. It copies the end section of an IFFT Packet tothe beginning of an OFDM Symbol.The OFDM modulation works on the principle of converting a serial symbol stream to a parallel symbol stream with each symbol from the parallel setmodulating a separate carrier. In thisthe addition of orthogonal carriers modulated by parallel symbol streams is equivalent to taking the IFFT of the parallel symbol set.In telecommunications, orthogonal frequency-division multiplexing (OFDM) is one ofthe methods of encoding digital data on multiple carrier frequencies.

II. NTT BASED OFDM

NTT can be useful for polynomial multiplication in a polynomial ring. if you transform coefficients to the NTT domain, the multiplication between coefficients of two polynomials is component-wise.The number theoretic transform is based on generalizing the n th primitive root of unityto a ``quotient ring'' instead of the usual field of complex numbers. Let Wn denote a primitive N th root of unity. We have been using $W_n = \exp(-j2(pi)/n)$ in the field of complex numbers, and it of course satisfies W_n^n, making it a root of unity; it also has the property that W_n^k visits all of the ``DFT frequency points'' on the unit circle in the zplane, as k goes from 0 to n-1 .In a number theory transform, Wn is an integer which satisfies

$W_n^n = (1 \bmod p)$ (2.1)

Where, p is a prime integer. From number theory, for each prime number p there exists at least one primitive root r such that r^n (modulo p) visits all of the numbers 1 through p-1 in some order, as n goes from 1 to p-1 . Since $m^{p-1} = (1 \bmod p)$ for all integers m (another result from number theory), r is also an n th root of unity, where n=p-1 is the transform size. (More generally, n can be any integer divisor L of p-1 , in which case we use $W_n = r^L$ as the generator of the numbers participating in the transform).When the number of elements in the transform is composite, a ``fast number theoretic transform'' may be constructed in the same manner as a fast Fourier transform is constructed from the DFT, or as the prime factor algorithm (or Winograd transform) is constructed for products of small mutually prime factors .Unlike the DFT, the number theoretic transform does not transform to a meaningful ``frequency domain''.

However, it has analogous theorems, such as the convolutiontheorem, which can be enabling it to be used for fast convolutions and correlations like the various FFT algorithms. An interesting feature of the number theory transform is that all computations are exact (integer multiplication and addition modulo a prime integer). There is no round-off error. This feature has been used to do fast convolutions to multiply extremely large numbers, such as are needed when computing (pi) to millions of digits of precision.It is commonly used in cryptographic schemes that are based on the hardness of the Ring Learning With Errors (R-LWE) problem to efficiently implement modular polynomial multiplication. . An OFDM signal consists of a number of closely spaced modulated carriers. When modulation of any form - voice, data, etc. is applied to a carrier, then sidebands spread out either side. It is necessary for a receiver to be able to receive the whole signal to be able to successfully demodulate the data.
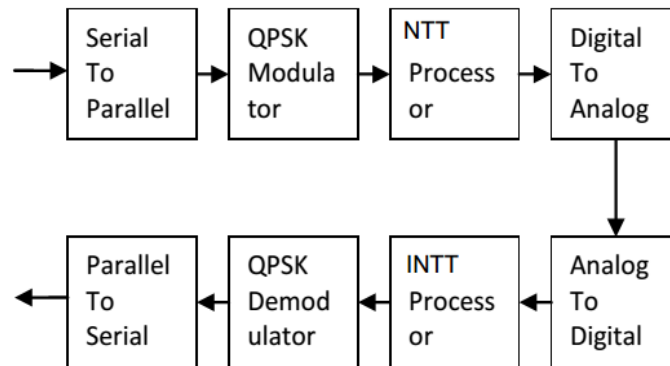

Fig2.1Block diagram of OFDM System using NTT and INTT

2.1 Schönhage – Strassen Algorithm

The SSA is an NTT-based solution for carrying out large integer multiplication. As shown in the SSA algorithm, let X and Y represent the u-bit integer multiplicand and multiplier,

respectively, and the two operands are partitioned into M digits using base B, where M = u/b and B = 2b. Moreover, zero padding is needed to extend both operands to 2M digits before performing cyclic convolution. The convolution is accomplished by doing NTT, point-wise multiplication, and INTT sequentially. The final result Z is then obtained by resolving carries on the INTT output according to the base B. NTT can be viewed as a discrete Fourier transform defined over finite field Zp [10]. An N-point NTT is defined as

$$X(K) = \sum_{n=0}^{N-1} X(n)(Wn)^{nk} \bmod m \qquad (2.2)$$

where $0 \leq k < N - 1$ and WN is a primitive Nth root of unity in Zp

III. QPSK MODULATION AND DEMODULATION

QPSK modulated signal is obtained by adding the signal from both in-phase and quadrature arm.As shown in Fig 3.1, of QPSK Modulation, here the input will provided as a Binary information, and its converted into 2Bit serial to parallel form, then the 2Bit form will provided to voltage control oscillator scheme of COS and SIN signal generator with Encode TX pulse, and its multiplied to carrier frequency then the signal to be added before transmission output. The QPSK modulation is determined a format of phase changes from previous signal. In the Quadrature modulation will have four possible states such a $0, \pi, +\frac{\pi}{2}, -\frac{\pi}{2}$. Hence this each state which is represents two information bits, it splitting of binary patterns as same of QPSK modulation technique, it shifter the phase to about $\frac{\pi}{4}$ or $\frac{\pi}{2}$ depending upon the requirement.
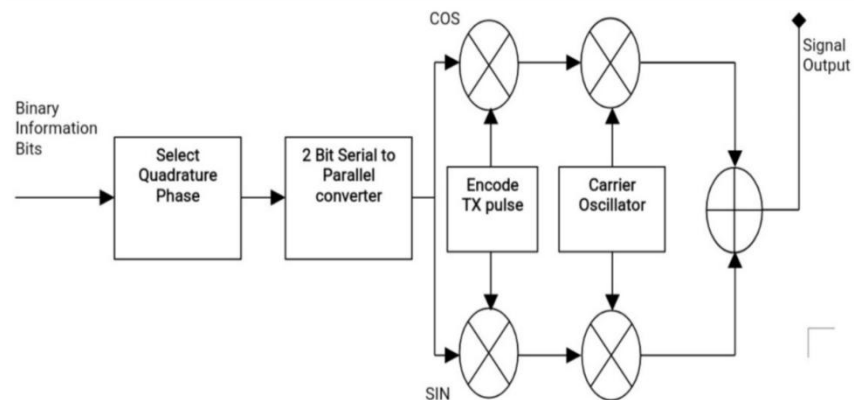
Fig 3.1Block diagram of QPSK modulator

In the Modulation of wireless communication technology will used to transfer the data by changing the frequency, amplitude and phase of the carrier signals, with this digital data of modulation scheme it will need to map the corresponding signals for example in the binary modulation '0' and '1' will be map to the time(t) of waveforms.In modulation each input data will form a group of bits to the form of M=2^b which is corresponding to M-ary modulation for M>2. The Quadrature Phase shift keying is also one of the modulation techniques of M-ary modulation M=4, with this M will denote as symbol of four distinct waveforms of different phase. The QPSK Modulation will achieve the same bandwidth, data throughput, bit error rate, power efficiency with compare to the QPSK. Four symbols of M=4 is located $0, \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}$, with equal spacing.
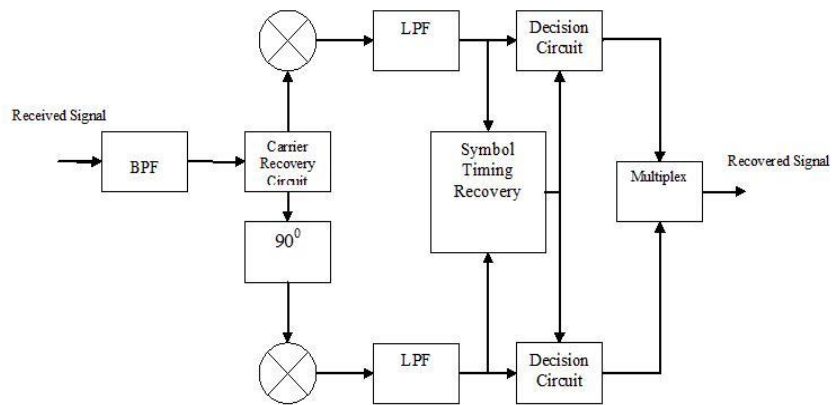
Fig 3.2Block diagram of QPSK Demodulator

The input signal of modulation will received to BPF(Band Pass Filter), it will reduce the noise in upper and lower range of input signal, and the signal will pass through carrier recover circuit, such as the numerical control oscillator will take to correct the error signal and generate the high frequency noise using COS and SIN multiplier, after multiplier the output signal will given to low pass filter(LPF), and we get the noise reduction output, it will given as a input of decision circuit, the decision circuit will find the range of frequency changes as per the modulation and generate the differential signal, those differential output will multiplexed and taken as a output in recovered signal.The distribution of the data across a large number of carriers in the OFDM signal has some further advantages. Nulls caused by multi-path effects or interference on a given frequency only affect a small number of the carriers, the remaining ones being received correctly.

IV. RESULTS AND DISCUSSION

4.1 SIMULATION OUTPUT
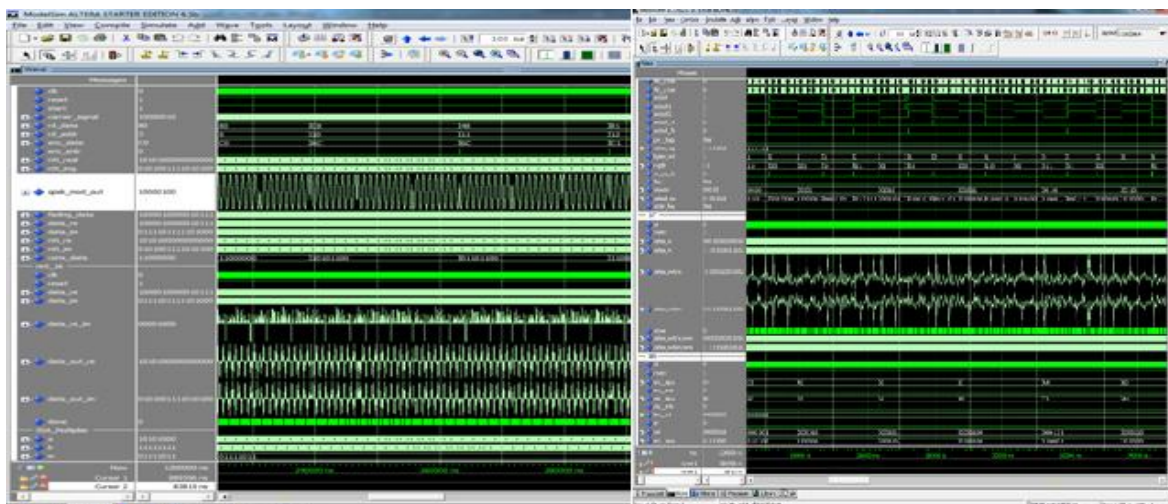
Fig 4.1 Modulated and Demodulated output

	LUT	Slice Register	Delay(ns)	IOB
OFDM-QPSK8-NTT-INTT	6242	1557	77.268	121

SSA Multiplier	838	0	89.361	32
NNT	3372	574	25.847	74
INTT	2340	549	24.503	66

Table 4.1 Comparison table for Area, Power, Delay And Memory

V. CONCLUSION AND FUTURE ENHANCEMENT

5.1 CONCLUSION

This paper explored feasible solutions for achieving large integer multiplication based on NTT. The aim of this project is implementing an OFDM system on xilinx using VHDL programming language. Implementation of transmitter and receiver is done independently and tested it on simulation environment, and then both the subsystems were merged to form one system. The system design procedure, tools and results are discussed above. By comparing the Area, Power, delay and memory consumed values, the OFDM transceiver based on NTT and INTT is providing more memory efficiency and high speed. The number of operands gets reduced by butterfly unit computations. From the simulation results the number of slice registersused for implementing OFDM is 1557, input output blocks are 121 and the delay resulted as 77.268ns.

5.2 FUTURE ENHANCEMENT

The project has a very vast scope in future. This application can be easily implemented under various situations. The future work aims to investigate the field in depth and achieve the designs for NTT and INTT based systems. And also, to implement the NTT and INTT based OFDM transceiver on FPGA.

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Hypervisor and Redemption –Awareness Analysis of 5G Networks

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Abstract-Recently, Fifth Generation (5G) cellular networks have gained promise as a paradigm that could provide rich computational resources for users. Virtualization is a key technology for wireless communications, especially in standard Long Term Evolution (LTE) systems, which enable cloud based multi-tenancy business models through providing a shared scalable resource platform for all users. Despite the potential significance of Hypervisor for cellular networks, several challenges remain to be addressed. For cellular networks, providing multiple levels of security is essential to support different levels in information sensitivity. However, placing different customers' services requirements on a virtualized evolved Node B's (eNB's) scheduler may lead to noticeable security vulnerabilities. In this work, we present an overview of cellular network security issues in a fully virtualized environment along with their preventative measures. Hypervisor is implemented by allowing service providers to share their resources while performing different scheduling policies and sharing one eNB. To evaluate the considered framework, the average delays for different traffic types were measured. The results of the simulation showed that virtualization could noticeably reduce average user equipment delay compared with the non-sharing scheme.

Index Terms -5G Cellular Networks, LTE, Scheduling, Virtualization, Security-Awareness.

I. INTRODUCTION

Wireless networking provides various advantages, particularly improving productivity due to increased accessibility to information resources. However, wireless technology is extremely vulnerable to new threats and exposes the existing profile to additional information security risks. For instance, unencrypted or weakly encrypted algorithms allow attackers to read private information, thereby compromising data confidentiality. Wireless networks have recently witnessed a tremendous growth in the data traffic due to the increase in the number of users that are always demanding higher data rates. In the Third Generation Partnership Project (3GPP), to cope up with the new demand for increased data traffic, network virtualization based architectures are being proposed for next generation networking in wireless domain , especially in Fifth Generation (5G) wireless networks. The sharing of resource blocks (RBs) by services' providers

(SPs) has gained significant attention in. Virtualization has helped in delivering number of benefits to operators such as sharing common infrastructure reduces the number of physical components required in the network resulting in minimizing their environmental and financial impact. Virtualization have almost made savings of over 60 billion USD in both operation and expenditures over five years worldwide.
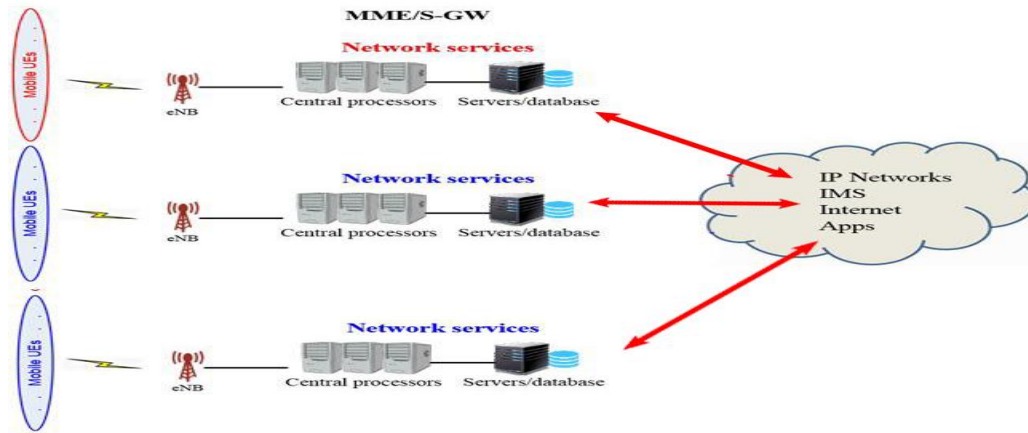
fig.1 LTE system architecture.

The Long Term Evolution (LTE) is designed by incorporating high security measures, by using strong cryptography and mutual authentication mechanisms between all network elements in LTE core. However, in a virtualization deployment, attackers can target mobile user equipment (UE) and LTE core with malware and spam, through eavesdropping, internet protocol (IP)- fraudulent , denial-of-service (DoS) attacks, and numerous other cyber attacks. SPs are aiming to use 5G deployment for expected increase business profitability but still have to fix number of security issues. Hence, to protect profit of SPs from being spent on the process of recovery and remediation due to frequent security breaches, SPs should curtail all sorts of security risks in both LTEs and IP, and this is achievable through active investment in preventative security measures. In the literature, few significant efforts have focused on mobile security challenges with respect to virtualization deployment.
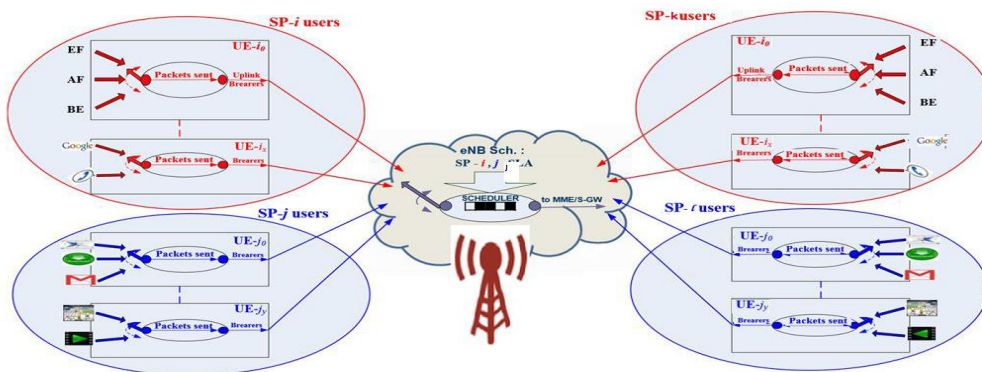
Fig.2 SPs implementing different scheduler policies and sharing radio RBs in a single eNB.

II. LTE SECURITY AWARENESS

The security management complexity is considered as key challenge as it is facing the steady rising attackers' interests. In this Section, some of them most common issues that are faced in wireless networks including DoS attack.

2.1. Issues and Preventative Measures

Following are some of the most common security issues and their preventative measures in LTE architecture as shown in Figure 2 that consists of network segments: UE, evolved node B (eNB) access, and evolved packet core

2.1.1 UEs

UEs are the end communications users that can be exposed to various security issues like:

•Physical Attacks

•Risk due to the loss of data

•Threats at application layer from malware, viruses, and phishing

.Physical Attacks: UEs are small, portable, and prone physical theft device itself. These devices can be also tampered making possible to access and attack the operator's networks.

Risk due to the loss of data: New UE are capable of downloading and storing more data than before, thus making them highly vulnerable to the attacks from infiltrators that are related to the data loss on the devices.

Application layer vulnerabilities: The present network architecture is all IP-based, as a result of which all UEs and LTE network elements work with IP packets. This opens up to new issues related to the vulnerabilities in IP-based systems that traditionally related to Internet such as malware, viruses, spam. Proper mechanisms should be in place to protect the integrity of the UE, the overall security in the LTE edge as wells as the subscriber, and finally the overall bandwidth (BW) usage on the SP network

Preventative measures:
- Subscriber Education
- Antivirus Applications
- Strong Authentication

Subscriber Education: It is important to educate the subscribers about the potential damages that could be caused by unsecured resources. It is advised to keep the resources in personal reach and location feature can be turned off for improved privacy.

Anti-virus Applications: Attackers are always looking for new ways to attack by making new viruses, malware, spyware or focusing on some vulnerabilities, it is essential the UEs should install and update anti-virus applications regularly Strong Authentication: Strong authentication. Mechanisms must be in place before accessing the contents of the UE from outside users. This will prevent attackers from having immediate access to the data on the UEs.

2.1.2 eNB Access- In the LTE network architecture, the eNB is the communication node between the UE and EPC network. It is also the intersection point wherein SPs are sharing their available RBs.

Security Issues:
- Physical attacks

- Rogue eNBs
- Privacy

Physical attacks: with the emergence of smaller eNBs, located in public domains, they are now more   vulnerable to physical tampering, through which the SP network can be accessed and compromised.

Rogue eNBs: Rogue eNBs can be installed by the attackers to emulate the operator's node and through them the attackers can intercept the traffic emanating from the UE. The attackers can therefore listen to the traffic and redirect the traffic to the malicious parties, Physical security: SPs have to devise mechanisms for physical safety and security of the eNBs placed in public locations, which can be accessed and tampered to expose the SP's network.

Authentication, authorization, and encryption: 3GPP specifies access security, which includes authentication, authorization, and traffic safeguard between the UE and EPC networks. Strong level of encryption between the eNB access and UE will identify both rogue eNBs and man in the middle attack. Adopting   public   key   based infrastructure, which stores the public key of the SP in the universal subscriber identity module that allows the UE to be able to encrypt private data such as the IMSI

Security architecture: SPs have to ensure that the service quality is not affected with the inclusion of the security architecture that consumes BW resources for the process of authentication and encryption.

Evolved Packet Core-

The EPC is the core of the LTE wireless network that will manage security related processes such as authentication, accounting and authorization. In addition to that, it will perform network management functions such as IP address allocation, mobility management, QoS, and control signaling.

Security Issues:
- Unauthorized access
- Over-billing attacks (IP address hijacking/spoofing)

Unauthorized access: Unless it is specifically designed by the SP and security protocols are enabled (i.e., IP security (IPSec) traffic between the evolved universal terrestrial radio access network (EUTRAN) and EPC is not secured that can allow attacker to gain access to unprotected traffic for performing malicious activities.

Over-billing attacks (IP address hijacking or spoofing): An attacker can take control of the IP address of a legal UE while it is being returned to the IP pool and can explore the UE's data. Alternately, an over-billing attack can exist when an IP address is maliciously reassigned to another UE.

Preventative measures:

•Security architecture: virtual local area networks
(VLANs) and virtual private networks (VPNs)

•Encryption and IKE/IPSec

•Load balancing

.

IV. RESULT ANALYSIS
Simulation Results
MATLAB was used to test both schemes presented with considering discrete event simulator..

PARAMETER	VALUE
Spectrum allocation	20 MHz

Carrier frequency	2 GHz
Number of subcarriers per RB	12 subcarriers
Neighboring subcarrier spacing	15 KH
RB bandwidth	180 KHz Slot duration 0.5 ms
UEs in SP 1	2 UEs (UEs 1,2)
UEs in SP 2	2 UEs (UEs 3,4)
SNR_h (UEs 2, and 4)	15 dB
SNR_h (UEs 1, and 3)	15 dB

Average AF Packet Delay With respect To Various sharing weights.
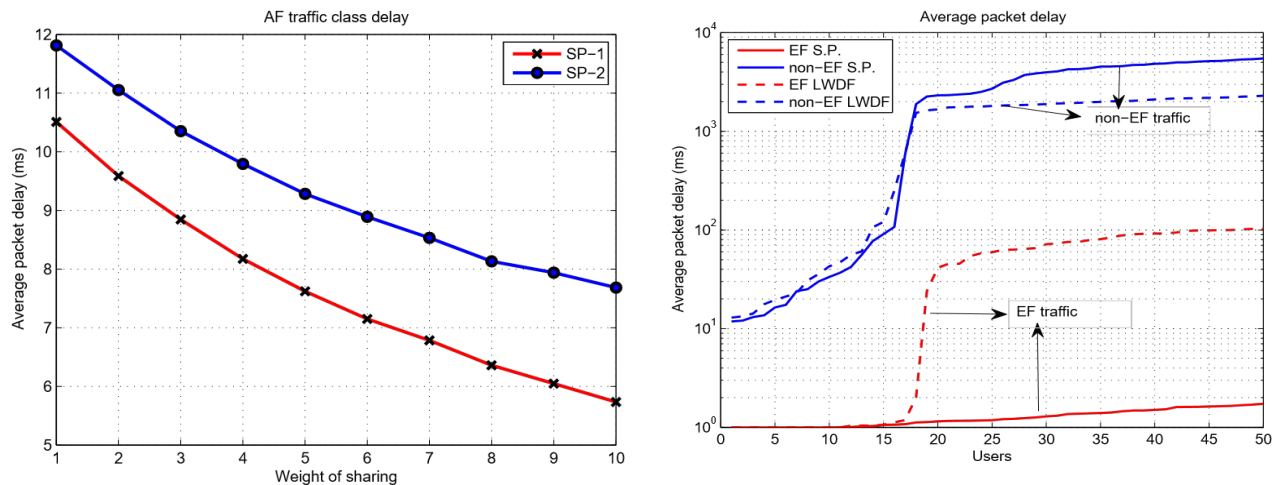
V. CONCLUSION

This research work discusses a trade-off between the security and virtualized schemes for downlink LTE systems that advantageously complement the infrastructure mode. In this study, RB sharing techniques for SPs on a single eNB were investigated. QoS requirements for different classes of services along with channel fading parameters were considered to do performance analysis. This paper also provided an overview of the key security risks that can affect an LTE structure that deploys virtualization as well as their preventative measures.

Evaluation the average packet delay and jitter for both the SS and DS schemes is provided that aims to limit the growing gap between the actual capacity in the backbone networks compared to the critical access infrastructures that connect the end-user networks. Overall, the simulation results prove that the DS framework provides notable improvements in average packet delay because of the larger pool of RBs available for the UEs. This improvement will help SPs to customize their efforts in order to schedule and control the sharing of their entire resource pool

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3. Explore the NI Developer Community for 5G

IoT Based Automated Blood Bank System

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ABSTRACT— Every year of nation require about 4 core units of blood out of which only maximum 40lakhs units of bloods are available. In the earnest time of a blood pre requisite, you can rapidly check for blood donation centers or healing centers coordinating a specific or related blood gathering and contact them through the Application.The proposed system aim is to make the effective communication between the blood donor and blood receptor based on IOT with help of Mobile Application, and to reduce the human errors and save the time. If receptor want specified blood group we have to send the message to that particular person on register member in our created application.There are used to five different types of sensors that are given below, Alcohol sensor, Heartbeat sensor, Loadcellsensor, Ultrasonic sensor.All the sensors are interfaced to the arduino mega. The sensing result will be shown the LCD.
Keywords—Arduino;Embedded Blood Bank;Blood donor; GSM; Android;

I. INTRODUCTION:

Today is more members are really interested to blood donating and many blood banks are available. But, blood donating is taken a more times and some timeoccurshuman error .So, this problem is over come to develop a mobile application and arduino. In blood donor and receptor request is accept to using mobile application, then the person one time given the blood after six months the message will be shown our mobile phones.The hardware part is used to the many sensors, that sensor is sensing result will be shown the LCD.The sensing data will be transfer to mobile application via Bluetooth and the data stored to mobile and cloud.

1.1 EXITING:

The existing system main objectives of the blood banks are providing blood to the patients with minimal blood transfusion error. The system existing is divided into three segments, the first segment consists Temperature sensor, IR sensor nodes which is installed in rack of blood bank, and the GSM Module for sending request of blood to the donors and blood banks all these are interfaced with Arduino Mega. Second segment consists of wi-fi module for data transfer to the server and third segment is displaying the status of available blood stock. All the real time status relates to the available blood stock of the blood bank is are displayed on web page.

1.2PROPOSED METHOD:

In the proposed system is used to reduce the human errors and to save the time for blood donor and receptor. This system categorized by two parts one is software part and another one is hardware part. There is used to many sensors and it will be sense the blood donor health level, and to shown the problem in LCD. All the sensor is interfaced to the arduino. The blood donor data base are store to could and mobile phone.

II. BLOCK DIAGRAM:

Block Diagram of Proposed Scheme The proposed work explores to find blood donors by using GSM modem and arduino based system. In this system, it consists of android application, GSM Modem, arduino. In android application, the person who wants to donate blood needs to register so that his information will be stored in the database. Application display three different screens such as Register, Query and about us screen. Donor needs to register his/her details such as Name, Gender, Address, Blood group and Mobile number. In query section patient needs to select required blood group and current address. Whole system is implemented using arduino. Whenever there is requirement for blood then patient will enter required blood group details. Then that information will be fetched from database and SMS/Notification will be send to the donor directly on his number which is stored at the time of registration. Hence, there will be direct communication between donor and patient [3].
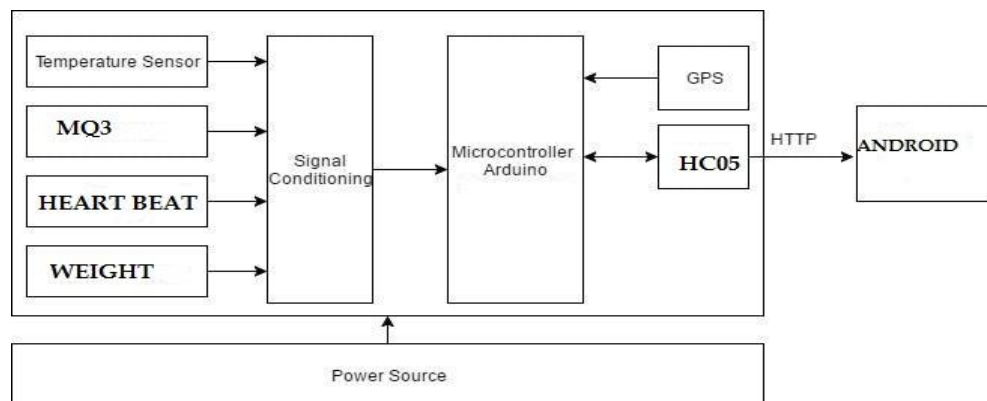
Android Application In proposed system, android application is designed using ETLIC app inventor ETLIC App Inventor is a visual programming based environment. App Inventor is an open-source web application for android which is originally provided by Google, and maintained by the Massachusetts Institute of Technology. It is provided with graphical user interface, it allows users to drag-and-drop visual objects for creating an application [2].
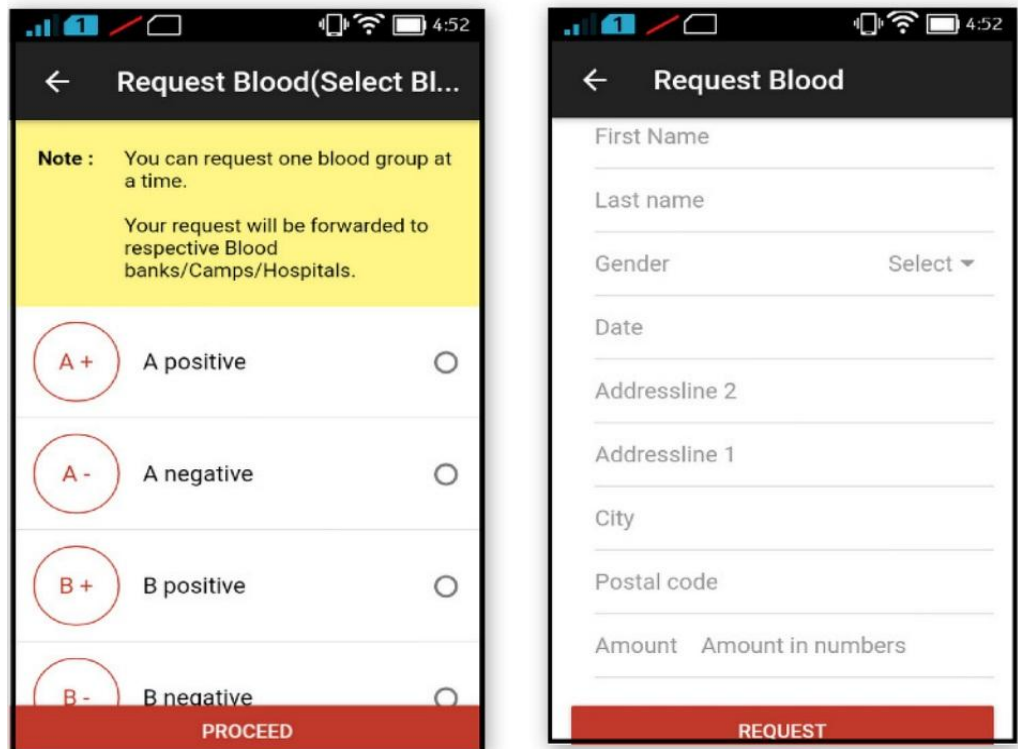
Figure 2 Request of blood receptor

B. Proposed System Flow

1. Person/donor who wants to donate blood needs to register his details

2. This detail will be stored in raspberry pi system database

3. User in ned of blood will have to select required blood group and current address

4. Correspnding blood donors information will be fetched and displayed on screen

5. Patient needs to select donor and send SMS option on the screen

6. SMS will be send to blood donor directly through GSM Modem
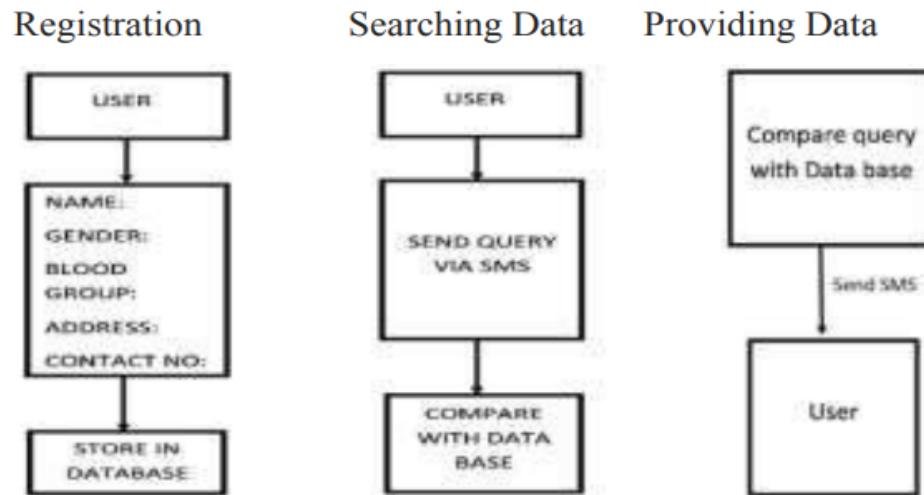
Fig.3 Proposed System Flow Chart

III. SYSTEM IMPLEMENTATION

Arduino ATmega-328 is basically an Advanced Virtual RISC (AVR) micro-controller. It supports the data up to eight (8) bits. ATmega-328 has 32KB internal builtin memory.You should also have a look at Introduction to PIC16F877a (it's a PIC Microcontroller) and then compare functions of these two Microcontrollers. ATmega 328 has 1KB Electrically Erasable Programmable Read Only Memory (EEPROM). This property shows if the electric supply supplied to the micro-controller is removed, even then it can store the data and can provide results after providing it with the electric supply. Moreover, ATmega-328 has 2KB Static Random Access Memory (SRAM).

1. HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions. HC-05 has red LED which indicates connection status, whether the Bluetooth is connected or not. This module works on 3.3 V. We can connect 5V supply voltage.

2. The ultrasonic sensor works on the principle of SONAR and RADAR system which is used to determine the distance to an object. An ultrasonic sensor generates the high-frequency sound (ultrasound) waves. When this ultrasound hits the object, it reflects as echo which is sensed by the receiver. By measuring the time required for the echo to reach to the receiver,

we can calculate the distance. Once we get the time we can calculate distance, as we know the speed of sound.HC-SR04 can measure up to range from 2 cm - 400 cm.

3.The MQ-3 Gas sensor can detect or measure gasses like LPG, Alcohol, Propane, Hydrogen, CO and even methane. The module version of this sensor comes with a Digital Pin which makes this sensor to operate even without a microcontroller and that comes in handy when you are only trying to detect one particular gas. When it comes to measuring the gas in ppm the analog pin has to be used, the analog pin also TTL driven and works on 5V and hence can be used with most common microcontrollers. So if you are looking for a sensor to detect or measure gasses like LPG, Alcohol, Propane, Hydrogen, CO and even methane with or without a microcontroller then this sensor might be the right choice for you

IV. IMPLEMENTATION RESULTS

A. Application Main Screen Figure shows the output screenshots for the android application main screen. It displays three tabs Register, Query and about us.
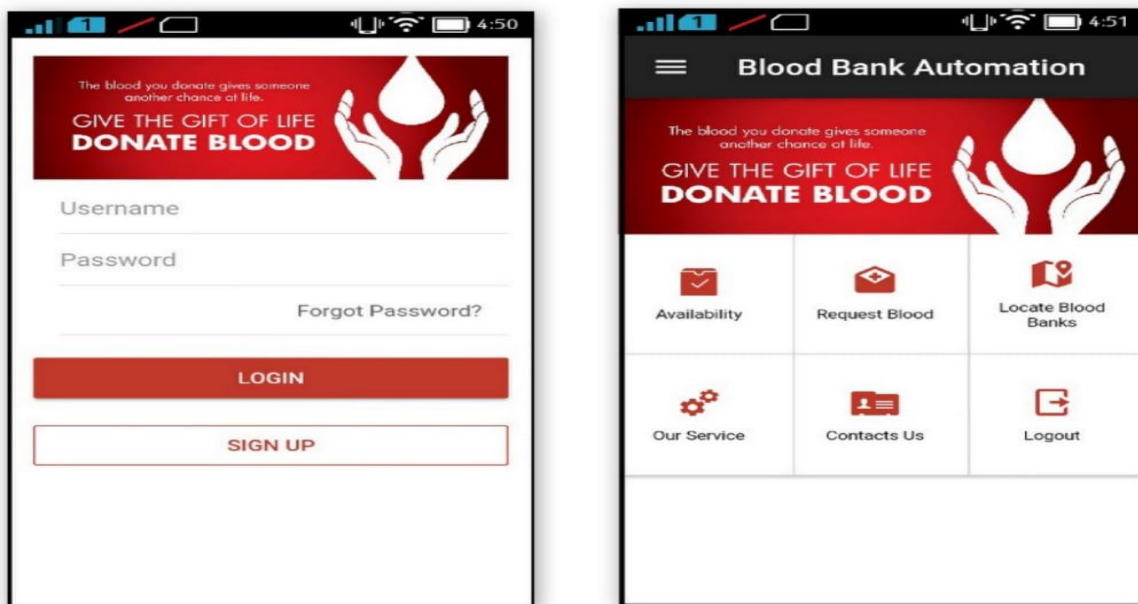
B.Registration Screen Donor needs to register his/her details such as Name, Gender, Address, Blood group and Mobile number.
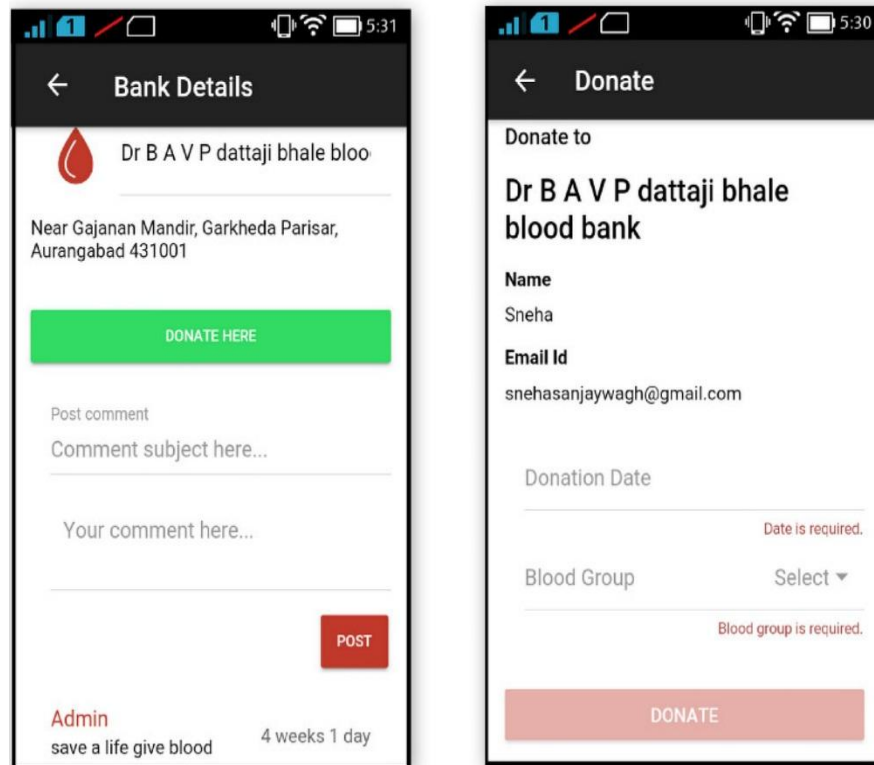
V. CONCLUSION

The proposed system can be used to reduce time span between donor and patient. The system consists of android application, raspberry pi and GSM modem. There is direct communication between donor and recipient through SMS so in case of emergency this system plays important role. Results shows different screens of the android applications where user needs to enter blood requirements.

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Smart Agriculture Fields based on IoT

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Abstract: This paper discusses about how water level can be managed efficiently by using smart irrigation systems. The normal traditional agricultural methods have many drawbacks in water management. It all overcomes by smart irrigation techniques by monitoring soil temperature and moisture level. Here agricultural lands are irrigated automatically without physical presence of farmer and it also uses smart mobiles for irrigation control. Automatic irrigation system uses sensor technology with micro controller to make smart switching device and this model shows basic switching mechanism of water motor/pump using sensor from any part of field by sensing moisture present in the soil. A comparative study is performed at the end of this paper to analyze various components used, merits and demerits of existing methods proposed for smart agriculture fields.

I.   INTRODUCTION

India is that the country of village and agriculture plays a awfully necessary role for development of country. In our country, agriculture depends on the monsoons that are deficient nowadays to provide required water. The irrigation is employed in agriculture field. In Irrigation system, relying upon the soil type, water is provided to plant. In agriculture, a pair of things area unit very important, initial to induce information of relating to the fertility of soil and second to measure condition content in soil. Nowadays, for irrigation, utterly totally different techniques area unit out there that area unit accustomed reduce the dependency of rain. And mainly this technique is driven by power and on/off designing. In this technique, water level indicator placed in water reservoir and soil wetness sensors are placed root zone of plant and close to the module and entrance unit handles the sensor information and transmit data to the controller which in turns the control the flow of water through the valves. The main imperfection of normal

irrigation system is wasting the water during filling in a reservoir and one more reason is over watering to plant.

This paper proposes a keen water system is developed with the help of moisture sensors and Arduino chips. In the system, we bury moisture sensor into the soil which would notify the system about amount of water present in the soil. With the help of a program, coded in C language, system will check the amount of water required by a plant, with predefined values in the program. If the moisture level is less than the amount of water needed by the plant, the program automates the flow of water from a submersible pump unless a threshold value is reached. This ensures that crop has been provided optimum amount of water without any manual labor or wastage. It improves efficiency of water usage, reduced cost of irrigation water, intelligent irrigation and possibility to reduce risks and water wastage.

II. STUDY ON EXISTING WORKS

In literature various analysis works has been done to enhance the performance of agriculture field. Some of them are discussed as follows. In [1] water wastage in irrigation system is the major problem. Water wastage is occurred by following reason the agricultural area receives power supply usually in non-peak hours, also frequent power cuts and low voltage supply creates severe problems to farmers. On the off chance that agriculturist neglects to go to the water system, there is possibility of wastage of water and power. Additionally, abundance watering prompts soil harm. In order to control and monitor the irrigation process, smart and automated irrigation system is developed, this system uses values ON and OFF to control water. This paper represents irrigation management system using Wireless Sensor Networks and water pumps. Water level sensor is connected to main irrigation tubes, and flow sensor is connected to water pump-set motor. This project uses raspberry pi for easy process and installation. The wetness detector is employed to live the wetness content of the soil. Blue term is associate humanoid application used to write programs, codes and send these codes to the most controller employing a native communication medium specifically BLUETOOTH.

Sushanth Gand Sujatha S [2] comes with a system that has the implicit to be helpful in water restricted geographically isolated areas. This system utilizing the water in a more sensible manner. An irrigation controller is used to open a solenoid valve and apply watering to bedding plants when the volumetric water content of the substrate drops below a setpoint. The system consists of a microcontroller and sensors like moisture, temperature, humidity. The system uses both wired and wireless connections for the communication between the sensors, microcontroller and the internet.Pushkar Singhand SanghamitraSaikia[3] explains and demonstrate a cost-effective and straightforward to use Arduino based mostly controlled irrigation system. Data are collected and transferred to Arduino that coupled to interactive web site that show the wet level required by a crop. The calculations aredone by using different sensors. This allows user to supervise irrigation pumps and sprinklers far away through a web site.

The Wireless Sensor Network is used in this model. The Wireless sensing element Network that collects the info from differing types of sensors and send it to the most server victimization wireless protocol.KiranmaiPernapati proposes a systemthat monitors the weather conditions, soil conditions of plant and water level in reservoir remotely using wireless sensors[7]. The Humidity and Temperature Sensor sense the both water vapor content and temperature around the plant. The Soil Moisture Sensor sense the soil moisture of a plant. A wireless Soil Moisture Sensor

helps out to measure the soil moisture content of a plan monotonously. And the system directs the irrigation system in such a way that it gets required quantity of water needs to be supply using relay.

III. MODAL SMART AGRICULTURE FIELD USING IoT

The given below Figure. 1 explains the entire process of smart irrigation system(www.fruitworldmedia.com).In this project they used soil moisture sensor, water temperature, rain sensor, and ESP8266. Sensors senses the moisture level from sand and water level in well. If the moisture level is dry means it sends signal to ESP8266 and indicate moisture level to user. The collected data from stored in cloud. We can continuously monitor the moisture level and water level from the smartphone. And we can also switch ON/OFF the motor from mobile itself.
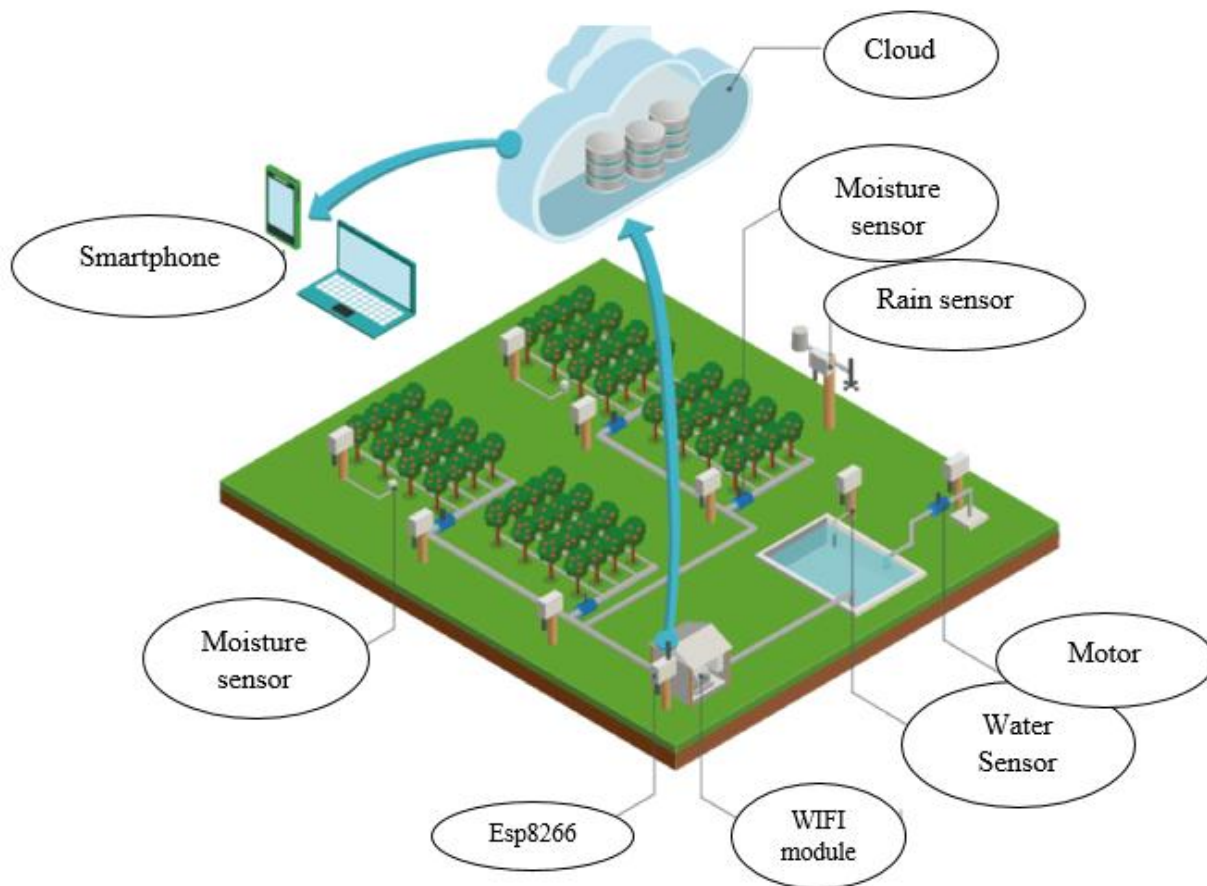
Figure 1: **Smart Agriculture Fields using Internet of Things**

IV. COMPARATIVE ANALYSIS

The comparative study is performed below to analyze various components used, outcomes of existing methods proposed for smart agriculture fields.

S.No	Authors	Year	Components Used	Outcomes
1	Vaishaliet al.	2017	Raspberry-Pi,Soil Moisture Sensor,Blue Term,Motor	Soil moisture level isnot intimated to user. It only sends alert SMS to user.
2	Sushanth G and Sujatha S	2018	Arduino,Moisture Sensor, Humidity sensor, Temperature sensor, Motion sensor,Relay, GSM module, Motor	User can't able to know whether the water is flown to every corner of the land or not.
3	Pushkar Singh and SanghamitraSaikia	2016	Arduino,Temperature sensor,Soil Moisture Sensor,Water flow sensor, ESP8266 Wifi module,Motor	Website Communication is needed to intimating information to user.
4	TamoghnaOjha, et al.	2015	Zigbee, GPRS/3g/4g modules, Wi-Max, Wi-Fi, Bluetooth, soil moisture sensor, temperature sensor.	Increase in cost, scalability has to be improved.
5	Nageswara Rao and Sridhar B	2018	Raspberry pi 3 – model, LM 358,Temperature sensor,Soil Moisture Sensor,Relay,Buzzer,Motor	This project rates high in cost and replacing of processor leads to high cost.
6	KiranmaiPernapati	2018	ESP8266,Moisture Sensor, Humidity sensor,Ultrasonic sensor,Relay,Motor	Sensor information and Water is not intimated to user.
7	Dweepayan Mishra et al.	2018	Arduino,Soil sensor,Motor	It senses only moisture level, and water flow is not intimated
8	KizitoMasaba et al.	2016	ESP8266,Moisture sensor, Temperature sensor,Bluetooth,Motor	It works on Bluetooth technology so it covers only limited region
9	DhirajSunehra and B. Harish Kumar	2017	Raspberry pi, wireless sensor network, soilmoisture sensor,temperature sensor, PIR sensor.	Sensor and motor conditions are intimated to user.

V. CONCLUSIONS

In this work, a detailed study is performed to analyze IoT based Smart Agriculture Fields.Previously famers are facing major problems in watering their agriculture fields. It is because they have no proper idea about when the current available so that they can pump water. The dampness/moisture sensors and temperature sensor measure the dampness/moisture level (water substance) and temperature of the plants. The irrigation systems used sensor technology with micro controller to make smart switching device and this model shows basic switching mechanism of water motor/pump using sensor from any part of field by sensing moisture present in the soil. Finally a comparative study was performed to analyze various components used, merits and demerits of existing methods proposed for smart agriculture fields.

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An Advanced Vehicle To Vehicle Collision Detection Technique Using Wireless Technology

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Abstract—This paper presents a framework of accident prediction with a new perspective. First, the new framework of Chain of Road Traffic Incident (CRTI) is proposed, in which the observed vehicle movement features are viewed as road traffic system's external "performance" that, in essence, reflect the internal "health states" (safety states) of the system at a specific time. A two-stage modeling procedure of CRTI is then proposed using scenario-based strategy: 1) a support vector machine is utilized to classify leaving lane scene versus remaining in lane scene and 2) Gaussian-mixture-based hidden Markov models are developed to recognize accident versus non-accident pattern CRTI given the classified scene. Moreover, the application procedure of the CRTI framework to online collision prediction is proposed. Finally, a simulation test of a typical vehicle collision scene based on PreScan platform is designed and carried out for model training and validation, and has shown promising results in accident prediction using the proposed framework. The CRTI framework could provide a new foundation for developing early warning/intervention strategies in driver assistance system under complex traffic environments.

Index Terms—Chain of Road Traffic Incident (CRTI), collision prediction, HMM, SVM, vehicle safety.

I. INTRODUCTION

The number of traffic accidents and resulting fatalities and injuries remain high in China and many other countries [1]. Roadway accidents are believed to be the integrated results of many factors, mainly in four aspects including driver, vehicle, roadway and environment. Physiological and psychological limitations of drivers, limited performance of vehicles, improper road alignment, as well as harsh weather caused risks (such as poor visibility and slippery road) may altogether lead to a roadway accident [2]. With the development of information and communication technology, more driving data related to collision (or "big data", including real-time driver behavior data, vehicle movement data, and environment data, etc.) would be available for collision research. Such large variety of data facilitates the employment of machine learning (which is especially useful for establishing relationships with unrecognized or uncertain factors [17]) and pattern recognition in collision prediction and prevention, based on which future risk prediction could be made with the uncovered driver-vehicle-road-environment interaction pattern rather than mere motion trends of related vehicles. For crash-related research area, machine learning and pattern recognition

techniques have already been used in crashdetection algorithms (such as for smart air bag system design in passive safety research) to capture the complex internal mechanism of multistage development of crash and have shown promising results [18]–[20]; however such techniques have not been extensively researched for collision avoidance regime.

We here propose a *Chain of Road Traffic Incident* (CRTI)
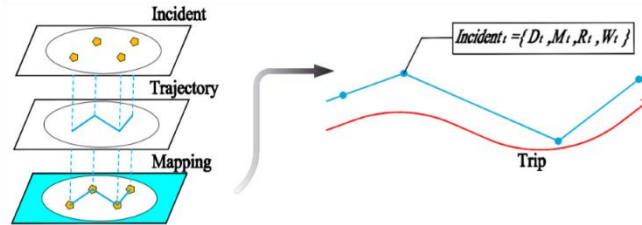
Fig.1.   Visual Expression of CRTI.

II. CONCEPT AND FRAMEWORK OF CRTI

A. Basic Concepts of CRTI

The concept of CRTI originates from Heinrich causal chain theory [21]. Before road traffic accident occurs, a series of incidents happened which together evolved into the final accident stage (i.e., the chain of road traffic incidents leading to traffic accident), just like a Domino Set. If the underlying evolving process of CRTI leading to an accident could be identified and recognized at an early stage, early warning or intervention could be made to avoid accidents, just like removing a Domino piece before the final Domino piece is hit down.
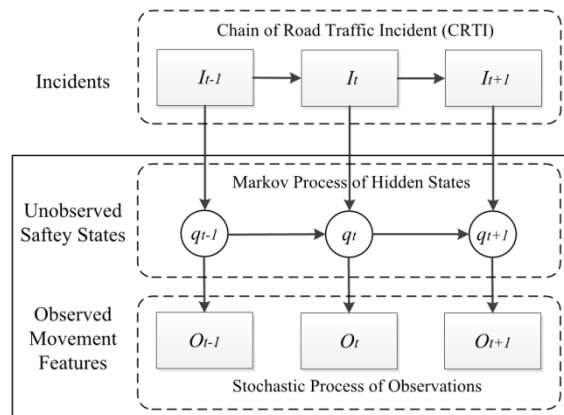
Fig. 2.   Underlying Concept of CRTI.

incidents from respects of human behaviors and environment variations, vehicle movement features are more easily retrievable and accurate in essence. Thus, in the paper, the evolving process of CRTI is studied through its external movement feature observations instead of incidents themselves.

As presented in Fig. 2, CRTI is essentially a stochastic process consisting of incidents in time series, where observed movement features could be viewed as a vector of road traffic system's external

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"performance" at time *t*, and such performance vectors reflect the internal "health states" (safety conditions) of the system. Such a system can be well described using Hidden Markov Model (HMM). HMM models a doubly stochastic process, including an underlying unobservable Markov process (hidden process) and another stochastic process producing a sequence of observable symbols influenced by the hidden process [22]. When applied to the CRTI problem, the observed symbols are the observed features of vehicle movements, while the hidden states correspond to the underlying driving safety conditions complying with the Markov assumption (i.e., the current hidden safety condition state depends only on the immediate-previous state). By specifying the transition probabilities between hidden states and the output probabilities of each state, the underlying structure of CRTI that generates the outcome (accident vs. non-accident) could be captured. Section III would describe the set-up of HMM for CRTI in detail.

B. Framework of CRTI Development

A scenario-based modeling and application framework is proposed for CRTI development, as profound discrepancies
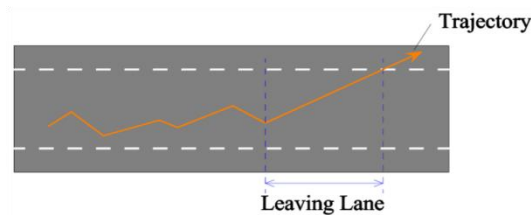
Fig. 3. Definition of Leaving Lane (LL) Scene.

and thus research is focused on LL/RL scene classification using SVM rather than rule development.

III. MODELING AND APPLICATION OF CRTI

Original CRTI Database

Original training and testing set for CRTI modeling can be collected on driving simulators, as sufficient real accident driving data are currently not readily available and difficult to simulate on real roadways for safety concerns. However, such data will certainly become available with the development of sensor and communication technologies, making our study here prospective and applicable.

Many researchers have explored simulation of roadway accident based on simulator or track [27]–[30], such as simulating risk scenarios caused by human (like high-speed driving and distracted driving due to dual tasks [27]), environment (like variation in traffic volume and road geometric configuration [28]), and unexpected events (like an unexpected entering of pedestrian into the road area [29] and a sudden perpendicular intrusion of vehicle into the crossroads [30]). Following similar ideas, in the paper, by developing typical predesigned causes-based vehicle collision scenarios, accident vehicle driving feature data could be obtained by simulator implementation. Section IV would give detailed description of simulation set-up and implementation for a specific scenario as an example.

IV. SIMULATION TEST AND ANALYSIS

A. Simulation Set-Up and Data Collection

To verify the effectiveness of the proposed CRTI framework, simulator test is carried out based on the PreScan simulation platform developed by The Netherlands Organisation for Applied Scientific Research (TNO). PreScan Graphical User Interface (GUI)-based preprocessor and synthetic sensors could be interfaced with Matlab/Simulink to build scenarios for simulator testing, including basic traffic environment such as road sections, infrastructure components (traffic signs, buildings, and trees), weather conditions (such as rain, snow, and fog), and light sources (such as the sun, headlights, and lampposts); as

well as behavior of other traffic participants (vehicles, and/or pedestrians, and/or bikes) under certain control system (with more information available at http://www.tassinternational.com/prescan-overview).

The simulation experiment is carefully designed as follows to obtain naturalistic driving data. To limit the room for maneuver performance, another two vehicles

(a) Approaching Stage   (b) Overtaking Stage
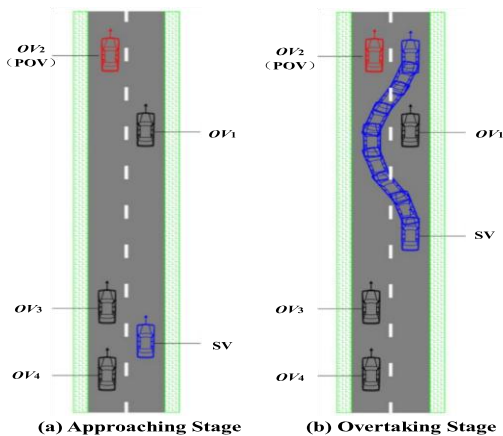
Fig. 8   Diagram of test scenario

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TABLE II

PARAMETERS OF SIMULATED TESTS. A) APPROACHING STAGE (B) OVERTAKING STAGE

Time to collision with OV_1: T s	7.2	9.6	10.8	12.0	14.4	16.2	18.0
Initial Speed of SV: S_O km	100	90	100	100	80	90	100
Speed of OV_1: S_1 km	60	60	70	70	60	70	80
Initial Speed of OV_2: S_2 km	60	60	70	70	60	70	80
Speed of OV_3: S_3 km	60	60	70	70	60	70	80
Speed of OV_4: S_4 km	60	60	70	70	60	70	80
Initial Distance from SV to OV_1: D m	80	80	90	100	80	90	100

"OV_3" and "OV_4" in Fig. 8) were traveling on the left side lane of the research vehicle at the same speed (to eliminate possible early overtaking maneuver of the research vehicle); also, the driver of research is required to complete simulator scenario within a time limit (to make the driver complete an overtaking OV_1 maneuver). The trajectories and speed of $OV_{1,2,3,4}$ could be pre-defined in Prescan and Matlab/Simulink, leaving the drivers' tasks to be trying to avoid a collision with the decelerating car OV_2 (POV) on the overtaking lane.

20 different drivers (10 males and 10 females, aged 22-25 years) were selected to perform 20 test runs for the selected scenario based on PreScan platform. Parameters of simulated tests are given in Table II. Specifically, a basic parameter T (Time to collision with OV_1) is used to characterize a trail, which refers to the travel time for the research vehicle to collide with its leading car OV_1 if no overtaking or acceleration/braking maneuver is taken. Mathematically, parameters T, S_0, S_1, and D should satisfy the following equation:

$$T * S_0/3.6 = T * S_1/3.6 + D. \quad (6)$$

B. Simulation Results

It should be noted that the simulation scenario here is designed and developed for a LL scene, and thus accident pattern recognizer HMMs are only developed for the selected LL scene-based scenario. Additional RL scene-based scenarios

TABLE III
EXPERIMENTAL DATA

Number of Samples		Training Sample	Testing Sample	Total Sample Obtained
Offline Sample	1st stage: SVM lassi ication (LL-RL	450	150	600 (300 LL vs. 300 RL instances
	2nd stage: AP-CRTI HMM	107	35	142 (LL accidents
	2nd stage: Non-AP-CRTI HMM	118	40	158 (LL non-accidents
Online Sample	1st stage: SVM-Scene Classification	0	200	200 (100 LL vs. 100 RL instances
	2nd stage: HMM-Accident Pattern Recognition	0	100	100 (48 LL accidents vs.52 LL non-accidents

TABLE IV
SVM CLASSIFICATION ACCURACY RATE AT 5% FALSE POSITIVES

Window Size (s)	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Accuracy Rate (%)	89.3	90.7	92.7	94.7	96.7	98.0	98.7

should be simulated to train specific HMMs to predict CRTI pattern when the vehicle is classified as in RL scene. As a result, we would only discuss LL scene accident prediction results in the following section.

1)   *Offline Training and Testing of the Two-Stage Model: 1st Stage SVM Scene Classification:* By trial and error of different combination of kernel functions, movement feature variables of the target vehicle, and data representation forms, the set-up of SVM for scene classification was optimized as follows: Radial Basic Function (RBF) was selected as the kernel function of SVM; selected movement feature variables include the pace of change in the heading of vehicle, steering wheel speed, and offset from lane boundary; variance and mean of the feature values within the window block were chosen to represent the data in SVM training.

(a)

(b)
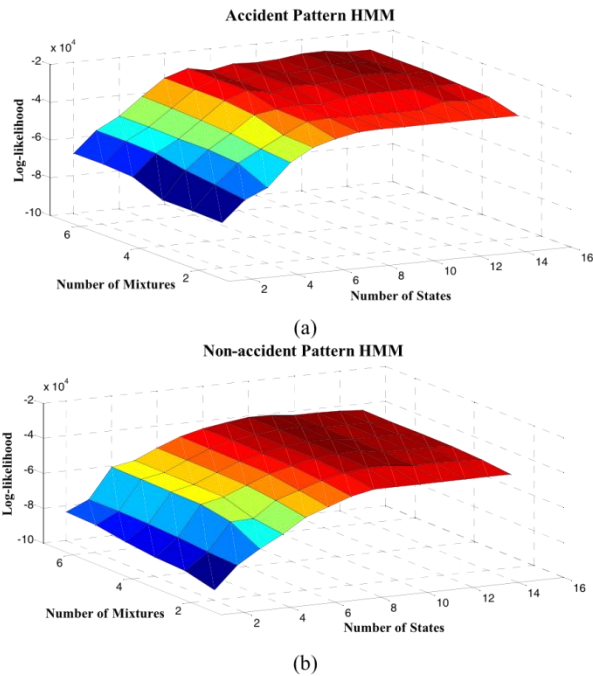
Fig. 9. "Leave-one-out" cross validation for HMM training. (a) Accident
pattern HMM with final state being an absorption state. (b) Non-accident pattern HMM with fully connected states.

2) *Offline Training and Testing of the Two-Stage Model: 2nd Stage HMM Accident Pattern Recognition:* By conducting experiments with different recorded parameters from the training sample, final vehicle movement feature variables selected for training HMM include the velocities (including both of numerical values and the direction angle between the two velocity vectors) of the two conflicting vehicles (i.e., the research vehicle and Obstacle Vehicle 2 in the research scenario), and the distance of their centers of mass. Accident and non-accident pattern HMMs are trained respectively using inductive training procedure listed in Section III-C, where parameters Q and M are determined based on cross-validation technique.
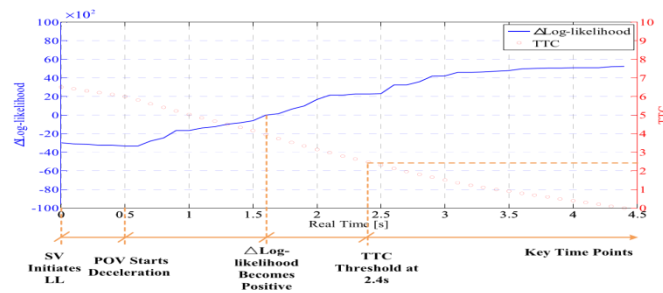
Fig. 10. Case example of Log-likelihood vs. TTC Curve.
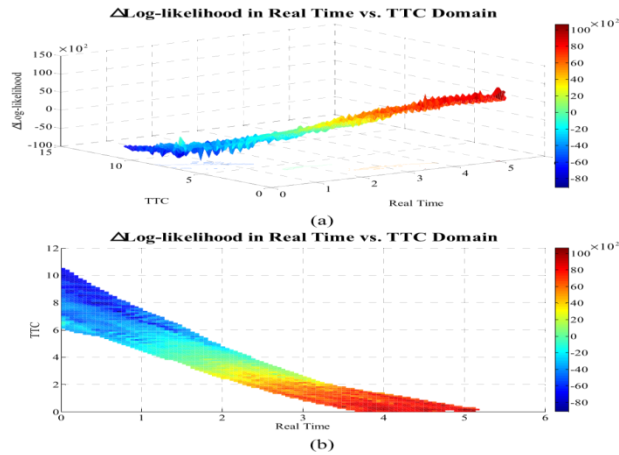
Fig. 11. Log-likelihood in Real Time vs. TTC Domain for Positively Recognized Online Accident Cases. (
3-D View. (b) Horizontal View.

V. CONCLUSION

The paper presents a new framework of accident prediction on the basis of the proposed concept *Chain of Road Traffic Incident* (CRTI). The concept makes use of assumptions in the theory of HMM, where observed vehicle movement features are viewed as road traffic system's external "performance" at a specific time, which in essence reflect the internal "health states" (safety states) of the system. A scenario-based two-stage modeling procedure of CRTI is constructed, including 1) *the 1st stage scene classification:* SVM is utilized to classify Leaving Lane (LL) scene versus Remaining in Lane (RL) scene; and 2) *the 2nd stage accident pattern recognition:* Gaussian-mixture based HMMs are developed to recognize accident vs. non-accident pattern CRTI given the classified scene. Moreover, the application procedure of the CRTI framework to online collision prediction is proposed. Finally simulation of a typical vehicle collision scene is designed and carried out based on PreScan platform, with the recorded driving data then applied to the proposed two-stage CRTI framework. Promising results have been obtained in accident prediction using the proposed framework based on simulation.

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An Energy Efficient Shift Register Based on Decoder Enabled Gated Pulsed Latch

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Abstract - A shift register is the basic building block in a VLSI circuit. Shift registers are commonly used in many applications, such as digital filters, communication receivers, and image processing ICs. Recently, as the size of the image data continues to increase due to the high demand for high quality image data, the word length of the shifter register increases to process large image data in image processing ICs. The proposed work uses a decoder enabled pulsed latch to design a low-power and area-efficient shift register. The area and power consumption are reduced by replacing flip-flops with pulsed latches. This method solves the timing problem between pulsed latches through the use of multiple non-overlap delayed pulsed clock signals instead of the conventional single pulsed clock signal. The shift register uses a small number of the pulsed clock signals by grouping the latches to several sub shifter registers and using additional temporary storage latches. A 16-bit shift register using pulsed latches was synthesized using Xilinx FPGA. The proposed shift register saves area and power compared to the conventional shift register with flip-flops.

I. INTRODUCTION

A. The Flip Flop: In digital circuits, a shift register is a cascade of flip flops, sharing the same clock, in which the output of each flip-flop is connected to the 'data' input of the next flip-flop in the chain, resulting in a circuit that shifts by one position the 'bit array' stored in it, 'shifting in' the data present at its input and 'shifting out' the last bit in the array, at each transition of the clock input. More generally, a shift register may be multidimensional, such that it's 'data in' and stage outputs are themselves bit arrays: this is implemented simply by running several shift registers of the same bit-length in parallel.

B. The Shift Registers: Shift registers can have both parallel and serial inputs and outputs. These are often configured as 'serial-in, parallel-out' (SIPO) or as 'parallel-in, serial-out' (PISO). There are also types that have both serial and parallel input and types with serial and parallel output. There are also 'bidirectional' shift registers which allow shifting in both directions: L→R or R→L. The serial input and last output of a shift register can also be connected to create a 'circular shift register.

The Shift Register is another type of sequential logic circuit that can be used for the storage or the transfer of binary data. This sequential device loads the data present on its inputs and then moves or "shifts" it to its output once every clock cycle, hence the name **Shift Register**. A shift register basically consists of several single bit "D-Type Data Latches", one for each data bit, either a logic "0" or a "1", connected together in a serial type daisy-chain arrangement so that the output from one data latch becomes the input of the next latch and so on. Data bits may be fed in or out of a shift register serially, that is one after the other from either the left or the right direction, or all together at the same time in a parallel configuration. The number of individual data latches required to make up a single **Shift Register** device is usually determined by the number of bits to be stored with the most common being 8-bits (one byte) wide constructed from eight individual data latches.

Shift Registers are used for data storage or for the movement of data and are therefore commonly used inside calculators or computers to store data such as two binary numbers before they are added together, or to convert the data from either a serial to parallel or parallel to serial format. The individual data latches that make up a single shift register are all driven by a common clock (Clk) signal making them synchronous devices.

Shift register IC's are generally provided with a clear or reset connection so that they can be "SET" or "RESET" as required. Generally, shift registers operate in one of four different modes with the basic movement of data through a shift register being:

- Serial-in to Parallel-out (SIPO) - the register is loaded with serial data, one bit at a time, with the stored data being available at the output in parallel form.
- Serial-in to Serial-out (SISO) - the data is shifted serially "IN" and "OUT" of the register, one bit at a time in either a left or right direction under clock control.
- Parallel-in to Serial-out (PISO) - the parallel data is loaded into the register simultaneously and is shifted out of the register serially one bit at a time under clock control.
- Parallel-in to parallel-out (PIPO) - the parallel data is loaded simultaneously into the register, and transferred together to their respective outputs by the same clock pulse.

One of the most common uses of a shift register is to convert between serial and parallel interfaces. This is useful as many circuits work on groups of bits in parallel, but serial interfaces are simpler to construct. Shift registers can be used as simple delay circuits. Several bidirectional shift registers could also be connected in parallel for a hardware implementation of a stack. SIPO registers are commonly attached to the output of microprocessors when more General Purpose Input/output pins are required than are available.

Shift registers can also be used as pulse extenders. Compared to monostable multivibrators, the timing has no dependency on component values, however, it requires external clock and the timing accuracy is limited by a granularity of this clock. In early computers, shift registers were used to handle data processing: two numbers to be added were stored in two shift registers and clocked out into an arithmetic and logic unit (ALU) with the result being fed back to the input of one of the shift registers (the accumulator) which was one bit longer since binary addition can only result in an answer that is the same size or one bit longer. Many computer languages include instructions to 'shift right' and 'shift left' the data in a register, effectively dividing by two or multiplying by two for each place shifted.

C. Latches: Very large serial-in serial-out shift registers (thousands of bits in size) were used in a similar manner to the earlier delay line memory in some devices built in the early 1970s. Such memories were sometimes called circulating memory. For example, the Data point 3300 terminal stored its display of 25 rows of 72 columns of upper-case characters using fifty-four 200-bit shift registers, arranged in six tracks of nine packs each, and providing storage for 1800 six-bit characters. The shift register design meant that scrolling the terminal display could be accomplished by simply pausing the display output to skip one line of characters.

This paper proposes a low-power and area-efficient shift register using pulsed latches. The shift register solves the timing problem using multiple non-overlap delayed pulsed clock signals instead of the conventional single pulsed clock signal. The shift register uses a small number of the pulsed clock signals by grouping the latches to several sub shifter registers and using additional temporary storage latches.

II. LITERATURE REVIEW
2.1. A Low-Power Double Edge-Triggered Flip-Flop with Transmission Gates And Clock Gating

In recent years, energy saving techniques has become critical in hardware designs, especially for mobile devices. This paper has reviewed several previous designs of double edge-triggered flip-flops, and has proposed a transmission-gate-based double edge-triggered flip-flop with a clock-gating function. Comparing to the previous work of double edge-triggered flip-flops, the proposed one saved 33.14% power on average (switching activity factor = 0-0.4) and it can save up to 97.85% power compared to conventional

single edge triggered flip-flops when the input is idle. In addition, the proposed design also improved performance by reducing Clk-to-Q latency by 0.21 ns.

2.2. Activity-Sensitive Flip-Flop and Latch Selection for Reduced Energy

This paper presents new techniques to evaluate the energy and delay of flip-flop and latch designs and shows that no single existing design performs well across the wide range of operating regimes present in complex systems. We propose the use of a selection of flip-flop and latch designs, each tuned for different activation patterns and speed requirements. We illustrate our technique on a pipelined MIPS processor data path runningSPECint95 benchmarks, where we reduce total flip-flop and latch energy by over 60% without increasing cycle time.

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2.3. Comparative Analysis of Master–Slave Latches and Flip-Flops for High-Performance and Low-Power Systems

In This Paper, We Propose A Set Of Rules For Consistent estimation Of The Real Performance And Power Features Of The flip-Flop And Master–Slave Latch Structures. A New Simulation and Optimization Approach Is Presented, Targeting Both High performance and Power Budget Issues. The Analysis Approach reveals the Sources of Performance and Power-Consumption Bottle necks in Different Design Styles. Certain Misleading Parameters have Been Properly Modified and Weighted to Reflect the Real properties Of the Compared Structures. Furthermore, The Results of The Comparison of Representative Master–Slave Latches and Flip flops illustrate The Advantages of Our Approach and the Suitability of Different Design Styles for High-Performance and Low-Power applications.

III. RESULT ANALYSIS

IV. CONCLUSION

A low-power and area-efficient shift register using decoder enabled pulsed latches is proposed. The shift register reduces area and power consumption by replacing flip-flops with pulsed latches. The timing problem between pulsed latches is solved using multiple non-overlap delayed pulsed clock signals instead of a single pulsed clock signal. A small number of the pulsed clock signals is used by grouping the latches to several sub shifter registers and using additional temporary storage latches. The proposed shift register saves 50% area and 19% power compared to the conventional shift register with flip-flops.

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Early Diagnosis of Parkinson's Disease Using Machine Learning Techniques

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Abstract - The Scans Without Evidence of Dopaminergic Deficit (SWEDD) is a non-degenerative variant, howeverit is clinically diagnosed as Parkinson's disease (PD). The effective diagnosis of PD from SWEDD helps for patient management in neural disorders. The Single Photon Emission Computed Tomography (SPECT) images providevaluable information about the content of dopamine in striatum, which improves the diagnosis of early stage PD.The present work proposes an effective system for Volume rendering SPECT imageslicesusing alpha stable distributionbased intensity normalization techniques for discriminating early PD from Healthy Control (HC) andSWEDD.The input images are chosen from Parkinson's Progression Markers Initiative (PPMI) database and the slices which has high specific uptake region are alone selected for further analysis. Statistical features are extracted, and classified using different machine learning techniques namely Naïve bayes, J48, Bayes net, Decision tree, K nearest neighbor.The highest accuracy is obtained by Decision tree classifier than other classifiers.These techniques are practiced to develop a promising diagnostic model for early diagnosis of PD.

Keywords- SPECT, PPMI database, SWEDD, Early PD, RBF- ELM, performance metrics

1. INTRODUCTION

PD is a movement disorder,causes due to deterioration of dopamine content in the striatum region of theSubstantia Nigra (SN). The PD is clinically recognizedby the cardinal symptoms like resting tremor, rigidity, postural instability, and bradykinesia, cognitive and psychiatric disturbances and it has an effective response to the drug levodopa (medication used to treat PD) in the advanced stage.However, the symptoms are unknown and ineffective response to levodopa at an early stage of the disorder[1, 2, 3].The SPECTimages are used for proper identification of dopamine content. Here the injected radiopharmaceutical drug binds to the dopamine transporters in the striatum. The distribution of the drug in the brain locates the dopamine content in it [4]. Hence the quantification of dopamine content in the human brain found to be an appropriate biomarker fordiagnosing PD.About 10-15% of PD subjects havenormal dopamine content in the scans, coined as SWEDD [5, 6]. PD medications to SWEDD subjects are not responding and regular follow up of these subjectsare also unlikely to have PD [7, 8].The GE health care report [9]states that thenormal scan has high striataluptake (dopamine), which forms symmetric shape or two comma shaped focal regions. Whereas an abnormal scan has reduced striatal uptake or circular region in one of the striatum,forming asymmetric shape.

Image processing techniquesuseintensitynormalization approaches to rectify the errors that arise due to physiological reasons and baseline calibration of gamma camera.Theintegral and Cube based intensity normalization [10, 11, 12] approaches computethe mean integral value and cumulative intensity values of the image pixels by setting reference region outside the striatum. In another method,the normalization is done based on the maximum intensity value of the voxels, which may lead to wrong normalization because of peak intensity values due to noise.In alpha stable distribution based intensity normalization,common reference region (outside striatum) is set for both normal and abnormal images.The reference region is normalized to quantify the dopamine contentin the striatum for easy and accurate diagnosis of PD [13]. The

quantification of dopamine for 2D image and averaging image slices are recognized as improved diagnostic technique in identification of early PD [14].

In addition to that, voxel (3D view of pixels) based analysis [15, 16] was also carried out, where the voxels are treated as features. The voxels are ranked based on its significance and top most features are taken for the analysis to diagnose Parkinson's disease.Voxel based analyses are found to be very tough for clinical practices [17]. Hence, the CAD system is involved for the quantifying the features of 3D image, which may comprehendthe specific uptake pattern during the normal and diseased state. The shape of the SWEDD and HC will not make much deviation from each other. Hence histogram based features like Mean, energy, entropy, correlation, skewness and kurtosis are used for discriminating SWEDD and HC [18].

The machine learning techniques like Bayesnet algorithm [19] is rooted on Bayes theorem andis representing the conditional dependencies between a set ofvariables.A J48,decisiontree [20] is a prognostic machine learning technique that categorizes the attributes of the testing dataset based on various attribute values of thetraining data sets.The Naïve Bayesclassifier [21] works on a simple Bayes rule of conditional probability. It considers all the attributes separately and classifies them into classes.

This paper organizes as follows. Section 2 contains the methods used like alpha stable distribution based intensity normalization, different classification algorithms. Section 3 describes the results and related discussions. Finally, conclusions are drawn.

II. METHODS AND MATERIALS

2.1 Alpha stable distribution based intensity normalization techniques

Volume rendering image slicesare normalized using alpha stable distribution, a heavy tailed and skewed distribution isfound with different mean and variance values. Alpha stable distribution understands by generalized Gaussian distribution, which satisfies the central limit theorem. The following equation represents the alpha stable distribution

$$f(X,\delta,\gamma,\alpha,\beta) = \frac{1}{\pi}\int_0^\infty e^{jt(x-\delta)}e^{(-\gamma t)\alpha(1-j\beta\tan(\frac{\pi\alpha}{2})})\,dt \tag{1}$$

The distribution is explained by the four parameters like characteristic exponent(α), skewness(β), location(δ) and dispersion (γ).The charateristic exponent describes the tail of the distribution and ranged (0,2). The skewness defines the left and right side of the skewness and ranged from (-1,1). If β is greater than zero,then it is skewed right side and if it is less than zero, skewed left side.The alpha stable distribution based intensity normalization considers the reference region outside the striatum region. Outside the striatum region must have the same intensity values interms of the four parameters. The maximum likelihood estimation methods are applied for estimating the parameter. The volume rendering image slicesare taken as input image. Out of 91 slices 12 slices are taken for the analysis, which has high striatal uptake region. Fig 1shows the volume rendering image slices of HC.
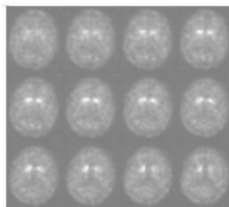
Fig. 1Volume rendering image slices chosen from SPECT

2.2 Feature extraction

The visual properties of the striatum (caudate and putamen) are able to computethe histogram based features which makes a better understanding of PD and SWEDD. The intensity represents the average values of all pixelin an image.

$$(.) = \overline{(.)} \tag{2}$$

where N is the total number of pixels. Entropy measures the randomness of the gray level of an image,represented in an Eqn.

$$Entropy = -sum(p.*log2\ (p)) \tag{3}$$

p is the histogram counts. Skewness is defined as judgment about image surface by defining the distribution differs from the normal distribution.

$$skewness = E\ \overline{\frac{^{-3}}{\sigma}} \tag{4}$$

μ & σ are the mean and standard deviation of the co-occurrence matrix respectively. Kurtosis is represented as measure of noise and resolution of an image in terms of nature of the distribution

$$kurtosis = E\ \overline{\frac{^{-4}}{\sigma}} \tag{5}$$

2.3 Classifiers

Bayes net is the short form of Bayes network is belongs to probabilistic Graphical Models (GMs). These models provide the information about the uncertainties of extracted features.   Each node in the graph indicates the features; the edges between the nodes denote probabilistic dependencies among the corresponding features.Naïve bayes is a probabilistic classifier uses bayes theorem for random independent features. It is a supervised algorithm which makes prediction based on its prior knowledge of training data[22].

The input variables are

$$= \ _{1}, _{2}, ... \tag{6}$$

The probability is constructed for an event $Y_j$the possible outcome is

$$= \ _{1}, _{2}, ... \tag{7}$$

X is predictor. Y is categorical levels present in the dependent variable.Then the Bayes rule is defined as

$$_{1}, _{2}, ... \ \propto \ _{1}, _{2}, ...() \tag{8}$$

( )is the probability that belongs to Y$_j$.It only assumes unrelated data for a given class variable. It uses the maximum likelihood method for a small amount training data.

Decision treebreaks the complex dataset into simple data using divide and conquer techniques, thereby providing solution for an easy interpretation [23, 24, 25].The input data is

$$= \ _{1}, _{2}, ... \tag{9}$$ It contains attributes $_{1}, _{2}, ...$.

K Nearest Neighbor classifies data automatically using supervised learning techniques. Initial centroid sets and groups the data which has minimum Euclidean distance.**J48**supervised classification algorithm is based on C5.4 algorithm for categorical data. It builds a C5.4 decision tree.

2.4 Dataset used

The SPECT images are taken from the international PPMI database. The hybrid ordered subset expectation maximization (HOSEM) algorithm, Iterative reconstruction, Attenuation correction has applied for processing the raw SPECT images. The details of the dataset used for the analysisare given in Table.1

Table. 1Details of input dataset

CATEGORIES	FEATURES
Total Number of Instances	70
Attributes	6
No. of classes	3
Data type	Numeric

III. RESULTS AND DISCUSSION

3.1 Preprocessing and Feature extraction

The extracted twelve slices are normalized using alpha stable intensity normalization and a mask is applied to extract histogram based features fromthe striatum region alone for the subsequent analysis.Fig. 2 shows the normalized and segmented image slices of PD. The extracted features are Area, intensity, correlatioon, entropy Skewness and kurtosis. The mean and standard deviation (SD) of the extracted features is given in Table. 3.It is evident from the chart that HC has large deviated values, whereas HC and SWEDD has overlapping values, hence the classification takes the important role to discriminate PD and HC, SWEDD.

Fig. 2 Normalized and segmented image for PD

Table. 2Mean and SD values for extracted features

Features	PD		SWEDD		Healthy Control	
	Mean	SD	Mean	SD	Mean	SD
Area	209.01	4.51	313	3.06	536.23	1.340
Intensity	267.22	5.66	400.12	8.01	598	6.50
Correlation	0.380	0.09	0.490	0.04	0.57	0.03
Entropy	0.120	0.10	0.14	0.06	0.18	0.04
Skewness	0.120	0.03	0.14	0.01	0.16	0.02
Kurtosis	2.560	0.20	2.59	0.10	2.61	0.30

3.2 Analysis of machine learning techniques

The performance of different classifiers is investigated using the WEKA tool box and represented in Table.3. The table shows the performance output of different classifiers like Naïve bayes, J48, Bayes net, Decision tree, K nearest neighbor. The tables show several sub items for easy analysis and assessment. All data, featuresare considered as instances and attributes for the analysis.The observation made from the table that correctly classified attributes for Naïve bayes, J48, Bayes net, Decision tree, K nearest neighbor classifiers are given as 93.8389 %, 94.3128 %, 94.7867 %, 97.183 %, and 180.2817 % respectively. The decision tree has given a higher accuracy (97.183 %) than other classifiers.Other parameters like time taken to build a model, Kappa statistic, Mean absolute error, Root mean squared error are given as 0.01, 0.9566, 0.0549, 0.1389.The kappa statistic is used to test the interrater reliability. All kappa value from the table lies above 0.9 except KNN classifier. The value above 0.9 indicates perfect agreement [26].The Mean absolute error and Root mean squared error of the decision tree also indicates that the very minimum error in the classification process.

Table. 3Performance metrics of different classifiers

	Naïve bayes	J48	Bayes net	Decision tree	K nearest neighbor
Time taken in seconds	0	0	0.01	0.01	0
Correctly Classified (%)	93.84	94.31	94.79	97.18	80.28
Incorrectly Classified (%)	6.16	5.69	5.21	2.82	19.72
Kappa statistic	0.91	0.92	0.92	0.96	0.70
Mean absolute error	0.05	0.04	0.05	0.05	0.13
Root mean squared error	0.17	0.19	0.15	0.14	0.36

IV. CONCLUSION

A comparative analysis is made for different classifier to identify early PD, HC from SWEDD subjects. The effective technique has been implemented for volume rendering imageslices to normalize the intensity value of the images. The histogram based features are extracted like Area, intensity, Standard deviation, variance, Skewness and kurtosis to make discrimination between the subjects. The extracted features are classified by Naïve bayes, J48, Bayes net, Decision tree, K nearest neighbor. It is found that Decision tree classifier performs well with the values of time taken to build a model, correctly classified, incorrectly classified, Kappa statistic, Mean absolute error, Root mean squared error0.01, 97.1831, 2.8169, 0.9566, 0.0549, 0.1389 respectively. This system aids the clinician to make the correct decision about PD, HC and SWEDD.

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FPGA Implementation of High Performance FIR Filter Design Using Distributed Arithmetic Based Approximate Sum of Products

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ABSTRACT: In a recent research of Approximate computing will provide a long lost bit error rate and also provide a power efficient with less area in digital signal processing applications. In a key component of arithmetic operations, a SOP (Sum of Product) method will have priority in approximate implementations such as calculation of inner products between vector based arithmetic operations. Here a arithmetic operation of approximate sum of product (ASOP) method will designed in three type of method in SOP Structure of K=3, N=16, these method will support without using multiplier design, such as 1) Generic method of ASOP1, 2) Priority encoder method of ASOP2, 3) Multi-Operation with truncated 18-m bits method of ASOP3. In this proposed work of this paper will implement this ASOP1, ASOP2, ASOP3 with using FIR Filter design, and shown the performance with this three method, and finally design this logic on VHDL and implemented with Xilinx FPGA-S6lx9, and shown the performance in terms of area, delay and power.

Key words: VHDL language, Xilinx FPGA-S6lx9,ASOP,FIR Filter.

I.INTRODUCTION

Approximate computing provides an efficient solution for the design of power efficient digital systems .For applications, such as multimedia and data processing, approximate circuits play an important role as a promising alternative for reducing area and power in digital systems that can tolerate some loss of precision. As one of the key components in arithmetic circuits, sum-of products (SOP) units have received less attention in terms of approximate implementation. Distributed arithmetic is a very efficient means for calculation of the inner products between vectors. It implements multiplication by doing a series of table-lookups and shift-and-accumulate operations. Due to the flexibility of the level of parallelism in the distributed arithmetic structure, the area-speed tradeoff can be adjusted. Distributed arithmetic is a bit-serial operation that computes the inner product of two vectors in parallel. It requires no multiplication and it has an efficient mechanism to perform the SOP operation. Bit-parallel versions of distributed arithmetic are proposed in this brief, three models of SOP units based on parallel distributed arithmetic are proposed. Approximate SOP (ASOP) model based on truncation is discussed in their scheme simply involves truncation in the number of lookup tables, by eliminating the least significant part of the distributed arithmetic operation. Multipliers have been extensively studied for approximate implementation. The probability-based multiplier of is based on the altering the partial products and reducing the generated partial product tree based on their probability.

II.OPERATIONS OF ASOP

Proposed Approximate Sum-of-Products Model ASOP1:

In approximate model 1, K is 3 and N is reduced. m bits at the least significant part of ak and bk for k = 1, 2, and 3 are truncated. m = 8, 6, and 4 bits are implemented. For this implementation, three two-input 16 − m bit adders, one three-input 16 − m bit adder, 16 − m lookup tables with eight

cases, and final accumulator with 16−m elements are required. This considerably reduces the hardware utilization at all the levels. The approximate model with reduced elements is shown in Fig. 2. In [5], by implementing with limits m to N −1, the number of lookup tables reduces to 16−m and 16−m elements are sent to the final accumulator (16 − m × 18). It should be noted that in ASOP1, the number of input bits to the adders is reduced, which further reduces the complexity of accumulator (16 − m × 18 − m), compared.
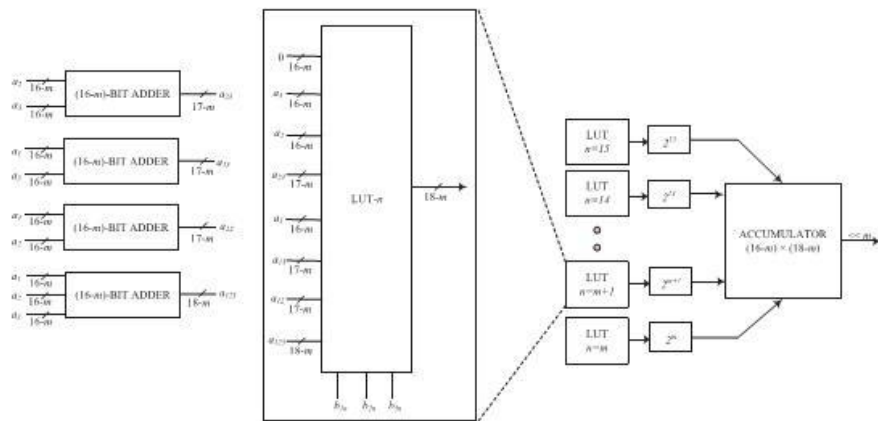
Figure 1: Approximate lookup table and corresponding ASOP (ASOP1)

Proposed Approximate Sum-of-Products Model ASOP2:

ASOP2 is similar to ASOP1 with the addition of m-bit leading one predictor. This increases the accuracy, and more suitable for DSP application which will be discussed later in this section. In our method, leading one prediction of ak and bk for k = 1, 2, and 3 requires OR operation of most significant m bits of ak and bk for k = 1, 2, and 3 followed by the priority encoder. The function of OR gates can be given as amOR = a1m|a2m|a3m and bmOR = b1m|b2m|b3m where km represents first m bits of kth element, for m = 4, 6, or 8. After the leading one prediction, ASOP1 structure is used for the computation of elements starting from the leading one position.
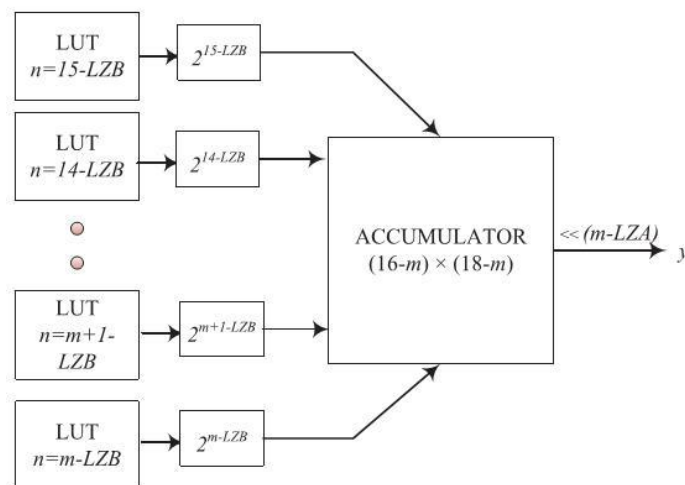
Figure 2: Approximate lookup table and corresponding ASOP (ASOP2) structure for K=3 and N=16

For example, consider the input elements as a1 = "00110010 00101110," a2 = "0001011000101011," a3 = "0010011001 101000," b1 = "0001001011101001," b2 = "0001101000101110," and b3 = "0000101011101011." For m = 4, amOR = 0011, leading one predictor predicts zeros in first two bits of bit positions "15" and "14" of a1, a2, and a3, 12-bit (16 − m) information starting from bit position "13" to "2" of a1, a2, and a3 ("110010001011," "010110001010," and "100110011010") are taken and fed to the inputs of the lookup tables.

For m = 4, bmOR = 0001, leading one predictor predicts zeros in first three bits of bit positions "15," "14," and "13" of b1, b2, and b3, 12-bit (16 − m) information starting from bit position "12" to "1" of b1, b2, and b3 ("100101110100," "110100010111," and "010101110101") are taken and fed as control signals of lookup tables. The overall structure of ASOP2 is given in Fig. 2, where LZA refers to leading zeros in amOR and LZB refers to leading zeros in bmOR . ASOP2 reduces the negative effects of truncation, especially when there is information only in least significant parts of the inputs. In DSP applications, pixel values are highly correlated and the number of initial zeros of ak and bk for k = 1, 2, 3 have high chances of being the same. Using OR gate for combining the elements and using a leading one predictor afterward reduces the hardware resources to be used tables. The overall structure of ASOP2 is given in Fig. 3, where LZA refers to leading zeros in amOR and LZB refers to leading zeros in bmOR . ASOP2 reduces the negative effects of truncation, especially when there is information only in least significant parts of the inputs. In DSP applications, pixel values are highly correlated and the number of initial zeros of ak and bk for k = 1, 2, 3 have high chances of being the same. Using OR gate for combining the elements and using a leading one predictor afterward reduces the hardware resources to be used.

Proposed Approximate Sum-of-Products Model ASOP3:

In ASOP1, the least significant part m = 8, 6, and 4 bits are truncated. In ASOP1, m bits are truncated from the 18-bit outputs of the lookup table contents. And also, m control signals b1n, b2n, and b3n of the lookup table for n = 0, 1, ..., m − 1 are truncated. In ASOP3, instead of truncation, approximation is employed. Lookup table output contents are divided into 18−m bits and m bits. The inputs b are divided to 16 − m group and m group. ASOP1 is used for the first 16 − m group. For the least m bits group of bk for k = 1, 2, 3, the control signals are grouped in pair. m lookup tables are reduced to m/2 tables. The additional hardware required for ASOP3 is given in Fig. 3.
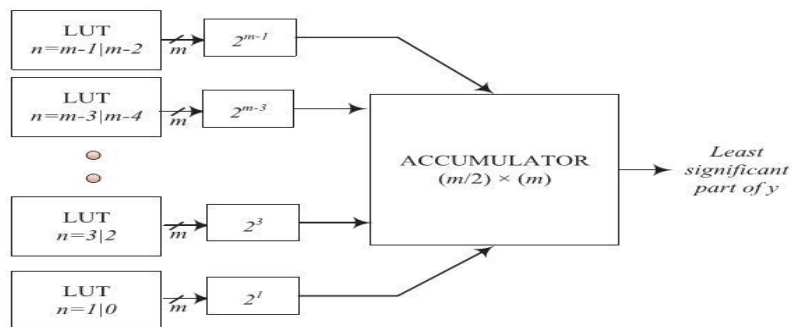
Figure 3: Least significant part of the ASOP (ASOP3) structure

For example, consider the input elements as a1 = "00110010 00101110," a2 = "0001011000101011," a3 = "00100110011 01000," b1 = "0001001011101001," b2 = "0001101000101110," and b3 = "0000101011101011." For m = 4, a23, a13, a12, and a123 are calculated, then except for least m bits, other bits are given to ASOP1 structure, and 12-bit (16 − m) information starting most significant bit of b1, b2, and b3 are taken and fed as control signals of lookup tables.

For the least significant bits calculation, least significant m bits of a23, a13, a12, and a123 are used as inputs to the lookup table. The number of lookup tables are reduced by half, by ORing each pair of control signals. In this scenario, for lookup table of n = 1 | 0, the control signals would be 111.

III. FIR FILTER DESIGN

In FIR filter designed, will used design any multipliers, if last frequent years, the MCM technique will used, as a proposed of FIR filter design, but the drawback is MCM technique will not work both thing of signed and un-signed operation, so it will we need to design separate MCM for signed and unsigned multiplication. So here, we are proposed a MCM with Rounded based approximate multiplier that includes both signed and unsigned operation in single multiplier, this multiplier will implemented in FIR Filter, and shown the efficiency of area, power and delay.

Filter coefficients very often remain constant and known a priori in signal processing applications. This feature has been utilized to reduce the complexity of realization of multiplications. Several designs have been suggested by various researchers for efficient realization of FIR filters (having fixed coefficients) using distributed arithmetic (DA) and multiple constant multiplication (MCM) methods. DA-based designs use lookup tables (LUTs) to store pre computed results to reduce the computational complexity. The MCM method on the other hand reduces the number of additions required for the realization of multiplications by common sub expression sharing, when a given input is multiplied with a set of constants. The MCM scheme is more effective, when a common operand is multiplied with more number of constants. Therefore, the MCM scheme is suitable for the implementation of large order FIR filters with fixed coefficients. But, MCM blocks can be formed only in the transpose form configuration of FIR filters.
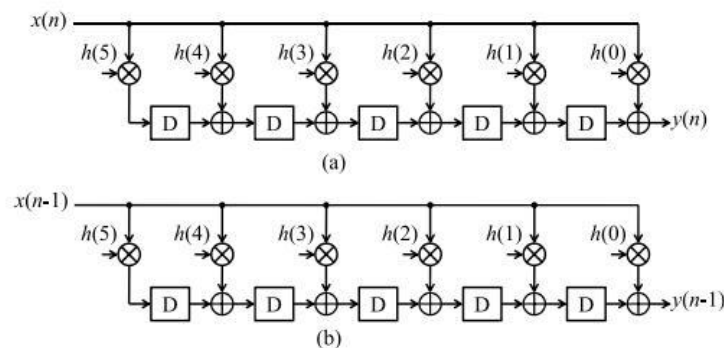
Figure:4 FIR Filter Diagram

Block-processing method is popularly used to derive high-throughput hardware structures. It not only provides throughput-scalable design but also improves the area-delay efficiency. The derivation of block-based FIR structure is straightforward when direct-form configuration is used, whereas the transpose form configuration does not directly support block processing. But, to take the computational advantage of the MCM, FIR filter is required to be realized by transpose form configuration. Apart from that, transpose form structures are inherently pipelined and supposed to offer higher operating frequency to support higher sampling rate.

IV. COMPARISON

AREA, POWER, DELAY AND MEMORY COMPARISON

	ASOP1	ASOP2	ASOP3	ASOP-FIR
Number of Slice LUT	347	353	290	59
Number of Occupied Slice	180	207	162	47
Number of IOB	65	68	71	8
Total Power (mW)	36	36	36	36
Delay(ns)	56.362	58.458	56.780	1.430

Table 1: Comparison Table

SIMULATION AND OUTPUT
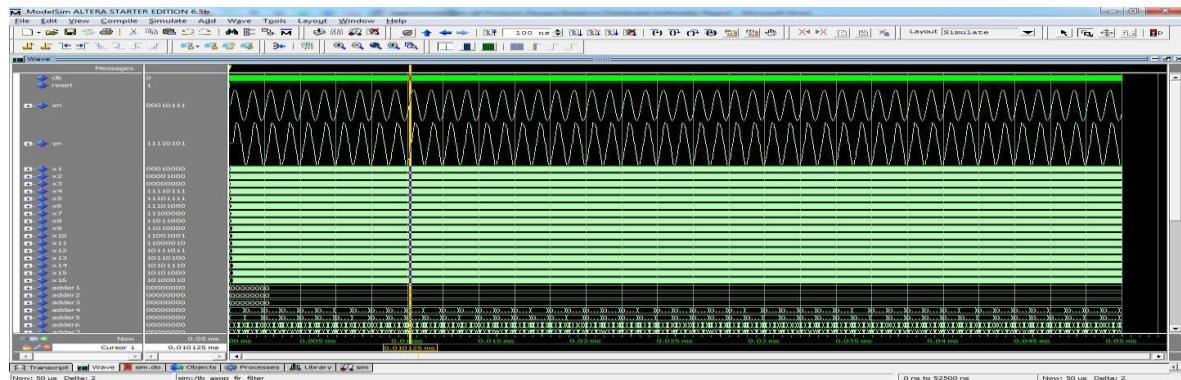
V.CONCLUSION

The aim of this project is Hardware implementation of an FIR filter design of FPGA using VHDL programming language to design and improve the performance of area, delay and power. In ASOP FIR filter achieve the number of slice LUT is 59%, number of occupied slice 47%, Number of IOB iS 8%, Total power (mw) is 36% and Delay is 1.430 when compared to existing system.

This feature has been utilized to reduce the complexity of realization of multiplication. Several design have been suggested by various researchers for efficient realization of FIR filter (having fixed coefficients) using distributed arithmetic (DA) and multiple constant multiplication (MCM) methods. DA-based designs use lookup tables (LUTs) to store pre computed results to reduce the computational complexity.

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Smart security device for the protection of women

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ABSTRACT:

Now-a-days women are facing many problems based on their security. The application which is proposed has access to track location and will send messages to the nearby police stations and the scanned phone numbers. This application is not only used for cases like rapes and any perverts teasing girls but this also helps them from any bad condition or any health problem like fainting suddenly. GPS is to track the location of the victim and to send messages, the location of the victim to the nearby police station and the phone numbers of the relatives of the victim. This application helps women to overcome their fear in going out and do things what they like to do.

INTRODUCTION

Physical devices through which all electronic devices is called the Internet of Things, cloud computing and sensors are connected. The privacy is very high in the Internet of Things. It is very helpful to people to develop a smart-based security. The sensors are developed in such a way that there is a automatic response without any triggering buttons. This can help people can overcome difficulties like women security, constructing smart city. Multiple sensors like flux sensor, vibration sensor, tilt sensor, heartbeat sensor and GPS are used for safety purposes. The GPS is used to identify the location. Heartbeat sensor is used to identify the heartbeat level, IOT is used to send the location and message to nearby police station if there is any high change in the heartbeat level. If any harassment , there may be chances of bending, inclinations, vibration and any bending are noted by tilt sensor, if there are different changes than the message is sent. Arduino, Raspberry pi3 are used in the proposed system. The application proposed gives the security system which is designed to help women to do their work with comfort and can to the places they wanted and work with comfort. Body sensors and GPS is used to track location and send messages to nearby police station and relatives.

LITERATURE SURVEY

Orlando pereira, et al (2010) proves the theory of using body sensors by using Network mobile solutions for biofeedback monitoring. The SHIMMER firmware and bluetooth firmware has been implemented in this work. The limitations of this work is bluetooth should be always connected to phone, it cannot be used if phone is lost[1]. MirjamJutila, et al(2014) proves the new concept of a wearable sensor vest for children. Safety vest Design, Gateway Implementation, Sensor web elements has been implemented in this work. The

limitations of this work is the device used is very big in size, it cannot be carried to places all can go [2]. Samuel Tanga (2016) proves the concept of sensors in his work" Development Of Prototype Smart Home Intelligent Lighting Control Architecture Using Sensors Onboard A Mobile Computing System" . "Luminaire controlled by the Arduino microcontroller" has been implemented. The limitations of this concept is wifi or internet is needed to work the application[3]. Threats in Information Security are life-threatening more particularly in medical field. [4]. Software providing more features and more security leads to increased execution time and also leads to poor usability of the software [5]. The application can be secured with fingerprint authentication for providing more security and to avoid false positive [6]. The Dynamic Cognitive System shows how the application can be protected against vulnerabilities and attacks in the social network [7].Parthsethi et al(2018) proves the theory of using alarm system in his work published in "Safe sole Distress Alarm system for female security using IOT". "Central controller, GSM module, GPS module gesture control System, smart phone connecting". Limitations of this work is the click in a mobile is needed there is no automatic detection[8]. Phooshkarrajiv et al(2016) proves the theory of using "Email in email based Remote access and surveillance system for smart home infrastructure". "The Email from embedded system to user and reply processing has been implemented in this work". The limitations of this work is the application is very costly and GPS and GMS are not used[9]. Enji Sun et al(2011) proves the concept of IoT and cloud computing in his work "IoT and cloud computing based dam monitoring and alarm system in mines". The limitations it is not automatic. It should be switched on by external activity[10]. Zhen yan et al(2014) proves the theory of using Internet of Things in his work .A system model of Internet of things has been implemented in his work. The limitation of this work is poor in work and setup takes a long time[11]. AlessioBotta et al(2015) proves the theory of integration of cloud computing and Internet of Things: A survey. RFID and wireless sensors, cloud computing has been implemented in this work. The limitations of this work is that the system is very poor in working. It is very costly to afford by poor people[12]. Luigi Atzori et al(2012) proves the new concept of social Internet of Things in his work . He claims how cloud and Internet of things are integrated. The limitations of this work is how the system works is not clearly mentioned[13]. S.Sicari et al(2014) proves the new concept of "security and trust in the internet of things" in his work. He claims that security, trust, privacy and authentication has been implemented in this work. The limitations of this work is security and authentication of the Internet of things is showed, but how sensors are connected is not showed[14]. Andre Gloria et al(2017) proves the new concept of IOT gateways in his work. The concept of IOT gateways, multiple communication protocols has been implemented in this work. The limitations of this work is a lot of hard work is needed to implement this and the application is also very costly to be implemented[15].

Carolyn Whitzman et al(2009) proves the new concept of women's safety in his concept .He claims that there should be some safety measures that should be taken by the women in the society. The limitations of this work is only the security of women is discussed, but the device has not been implemented[16]. Minchen et al(2016) proves the concept of smart clothing, in his work "Connecting human's report with clouds and big data for sustainable health monitoring". Intra smart clothing system , communications for Inter smart clothing sustainable health monitoring for chronic diseases has been implemented[17].

Mandeep Singh (2015) proves the wireless integrated device in "AN IoT security model design and validation of Android based wireless Integrated device for health monitoring. A devicce for body parameter measurement with the set of measuring algorithms and the mobile phone to increase tele medical capacity" has been implemented. Limitations of this concept is this an android application and the victim cannot be in a position to open phone and click on the application for help [18].

Susana P.Costa(2015) proves the concept of wearables in his work "Integration of wearable solutions in AAL environments with mobility support. AAL, wearable solutions for a mobile environment" has been implemented. Limitations are, although it is a wearable device, it just needs a click to activate the wearables [19].

John Ayoade (2007) proves the concept of RFID in his work "Roadmap to solving security and pure concerns in RFID system. Supply chain effectiveness, waste disposal has been implemented[20]. Rolf H. Weber(2010) proves the concept of privacy and security in his concept.

MOTIVATION

The challenging situations facing by each women now-a-days gave motivation to come up with a security device to help the women to do the work they liked to do. The application helps women to over come their fear and can roam freely and complete their works.

PROPOSED SYSTEM

Multiple sensors are used such as heart beat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the heartbeat, declination, vibrations of Heartbeat sensor is connected to the Arduino. The range of heartbeat is adjusted using

Arduino c software. Tilt sensor is also connected to Arduino-uno board to get if there is any declination. Vibration sensor is also connected to Arduino-Uno board to notes the vibrations, (if there is any different or abnormal vibrations). The readings are noted for every 20 milliseconds delay.

ARDUINO

Arduino is a micro controller to which sensors are connected. It can be purchased either online or in any stores. Arduino looks like a credit card sized board. There are many versions of arduino. In this application arduino-Uno board is used. BY using cable Arduino board is connected to laptop to get power. Arduino -UNO board is used in this application.

RASPBERRY PI 3

Raspberry pi is a series connected credit card sized microprocessor. There are different types of raspberry pi. It has a high speed connection compared to other raspberry pi and it has storage up to 1 Giga Byte. It is set in a way that the health condition of the person who wears this device is noted and stored in the cloud for every 20 milliseconds It is a micro processor to which GPS is connected and every record of health condition of women is noted and stored in the cloud and if there are any variations or any severe conditions the GPS sends the messages to the nearby police station and relatives.

HEARTBEAT SENSOR

Heartbeat means the heart contrasts and expands while pumping blood, the sound is heard while doing. The average heartbeat range for human is 72 per minute, if heartbeat rate is too low it means there may be any bad health condition, high heart beat rate, then there is a big tension faced by the victims. If there is a heavy change, the record of women is taken for every 20 milliseconds then the messages are sent to the nearby police station.

VIBRATION SENSOR

Vibration sensors are used for touch and vibration measurement. whenever a women moves, there will be acceleration. A vibration is generated when it is physically accelerated. There are different vibrations for different sounds. The track of vibration is noted for every 20 milliseconds. If there are different vibrations noted then the location is tracked and messages are sent to the nearby police station.

TILT SENSOR

Tilt sensor allows you to find orientation or inclination. These are low budget and easily used. They will not be damaged if used properly. The simplicity of tilt sensor makes popular for toys, gadgets and appliances. These are also called as "mercury switches", "tilt switches" or "rolling ball sensors" for their perspective reasons. If there is any inclination or orientation, the records will be recorded for every 20 milliseconds and if there is any bad issue, action will be taken.

GPS/GMS

GPS is used to locate the longitude , latitude of the victim. The GPS tracks the location of the victim if any of the sensors shows bad output. The latitude and longitude of the

location is tracked and the location is sent. In this we use c programming to send the messages by using SMTP protocol.

ARDUINO C

Arduino c software which is used to take the details of micro controllers or sensors. C programming language is used to adjust the range of sensors.

IMPLEMENTATION

Arduino - Uno board is used as a micro controller. These sensors are connected to the Arduino - Uno board. Heart beat sensor is connected to the S1 pin and the s1 pin is input. S2 pin of Arduino - Uno board is connected as output to heartbeat sensor. Hand is placed on the heartbeat sensor, Arduino board is connected to the computer by using a cable, by using Arduino c software the readings are noted and for every 20 milliseconds delay the readings are noted.

Tilt sensor is also connected in same way as heartbeat sensor is connected. Tilt sensor gives bending or inclination in all directions.

Vibration sensor is also connected in the same way as the above sensors. Vibration coming from all directions are noted in this sensor.

Raspberry pi3 is a microprocessor, it is connected with Arduino. GPS is fixed in the raspberry pi. If there is any emergency message will be sent to the nearby police station.

COMPARISION

In Existing System, many applications such as mobile applications like "HELP ME ON MOBILE" is developed. *91# codes are also developed. If there is any emergency to that code women either call or send message

In Proposed Work, multiple sensors like the heartbeat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the condition of women if there is any emergency the message and the location is automatically sent to nearby police station and relatives.

The Existing system needs a single click to get help. At sometimes women in the situation where a single click also cannot be done. May women be in a block out stage. At that time, body sensors help her to detect automatically.

CONCLUSION

A safety device for women, which can be carried using GPS and three different sensors has created. This may help women when there is any emergency.

The   GPS   sends message automatically to the nearby police station and relatives by tracking their location. This may help women to move freely wherever she wants.

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FPGA Implementation of Approximate Error Detection and Correction in Fault Tolerance Code of Hamming and BCH with using Stochastic Checkers

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ABSTRACT

In digital signal processing based application method will have number of errors occur during signal transmission and reception. it reliable with conventional fault tolerance technique with resilience of application domain such as multimedia, recognition, mining, search, and analytics. To overcome this challenge, here propose to added a stochastic method in fault tolerance error correction codes, as a new approach to performing error checking and correcting in an approximate manner at greatly increased in error coverage, long error detection latency. the method of stochastic pipelined inaccurate and required long latencies for computation, and a stochastic computing will operate a random bits numbers in complex tasks with a much smaller hardware in a characterized by use of pseudo-random numbers implementation by 0-1 sequences. Here propose a new method of fault tolerant parallel filters with stochastic checkers with using Hamming and BCH codes and also implement single fault error correction and multiple fault error correction method. In this method to implement in VHDL and synthesized in Xilinx FPGA-S6LX9, finally compared with Hamming and BCH codes based stochastic error correction and shown the compared terms of area, delay and power.

Key words: **Hamming code,BCH code,VHDL language,Xilinx.**

I.INDRODUCTION

Stochastic an approach to design approximate error checkers using stochastic logic. In stochastic computing (SC), numbers are represented as signal probabilities of pseudorandom bit streams. The key advantage of SC is that various arithmetic operations can be implemented in a highly power and area efficient manner (e.g., a multiplier is implemented using just a single AND gate since the signal probability at its output is the product of the input probabilities). Another interesting property of SC is that the precision of the computation progressively increases as the computation proceeds.Stochastic computing will operate a random bits numbers in complex tasks with a much smaller hardware in a characterized by use of pseudo-random numbers implementation by 0-1 sequences.Digital filters are one of the most commonly used signal processing circuits and several techniques have been proposed to protect them from errors. The use of reduced precision replicas was proposed to reduce the cost of

implementing modular redundancy in FIR filters. In all the techniques mentioned so
far, the protection of a single filter is considered Therefore, a significant cost reduction
compared with TMR was obtained.

1.1 STOCHASTIC CIRCUITS
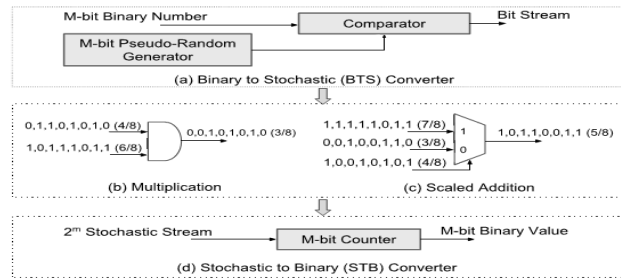
Fig 1 : Key components of a Stochastic circuits

We propose StoCK, an approach to design low-overhead checkers using stochastic
logic for applications that can tolerate approximate computations.

II. PARALLEL FILTERS WITH THE SAME RESPONSE

A discrete time filter implements the following equation:

$$y^{[n]} = \sum_{i=0}^{n} x[n-1] \, . \, h[i]$$

where x[n] is the input signal, y[n] is the output, and h[l] is the impulse response of the
filter. When the response h[l] is nonzero, only for a finite number of samples, the filter
is known as a FIR filter, otherwise the filter is an infinite impulse response (IIR) filter.
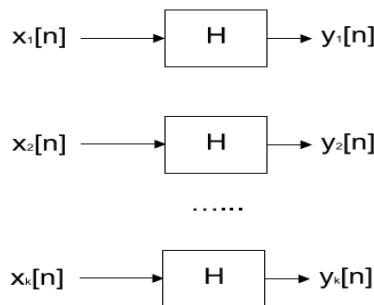
Fig 2: Parallel filters with the same response

$$p1 = d1 \oplus d2 \oplus d3$$
$$p2 = d1 \oplus d2 \oplus d4$$
$$p3 = d1 \oplus d3 \oplus d4.$$

The data and parity check bits are stored and can be recovered later even if there is an
error in one of the bits.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}.$$

Encoding is done by computing $y = x \bullet G$ and error detection is done by computing $s = y \bullet HT$, where the operator $\bullet$ is based on module two addition (XOR) and multiplication. Correction is done using the vector s, known as syndrome, to identify the bit in error. The correspondence of values of s to error position is captured in Table I.

s1 s2 s3	Error Bit Position	Action
0 0 0	No error	None
1 1 1	d1	correct d1
1 1 0	d2	correct d2
1 0 1	d3	correct d3
0 1 1	d4	correct d4
1 0 0	p1	correct p1
0 1 0	p2	correct p2
0 0 1	p3	correct p3

III. Proposed scheme for four filters and Hamming Code
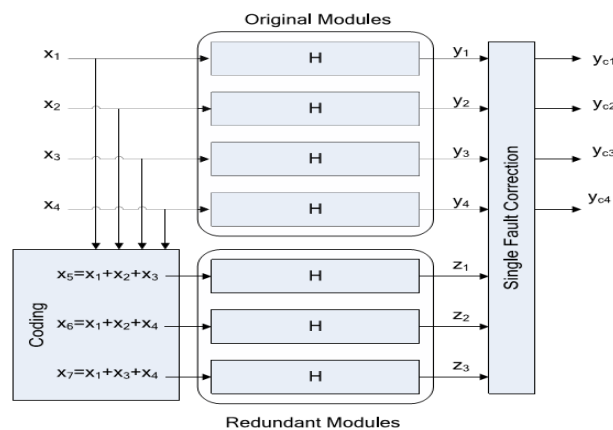
Fig 3. Proposed scheme for four filters and Hamming Code

Hamming code is a set of error-correction codes that can be used to detect and correct bit errors that can occur when computer data is moved. Hamming codes can detect up to two-bit errors or correct one-bit errors.

3.1 Proposed scheme for four filters and a BCH Code

BCH codes are important subclass of the cyclic codes.It is named after the inventors: Bose, Ray-chaudhuri and Hocquenghem .
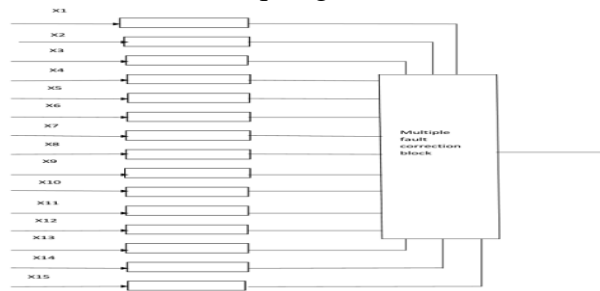
Fig 3.1 Proposed scheme for four filters and a BCH Code

IV.RESULTS AND DISCUSSION

4.1 HAMMING CODE SIMULATION OUTPUT
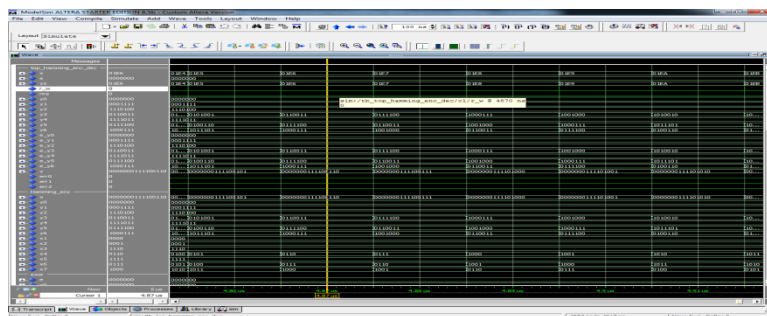
4.2 BCH CODE SIMULATION OUTPUT
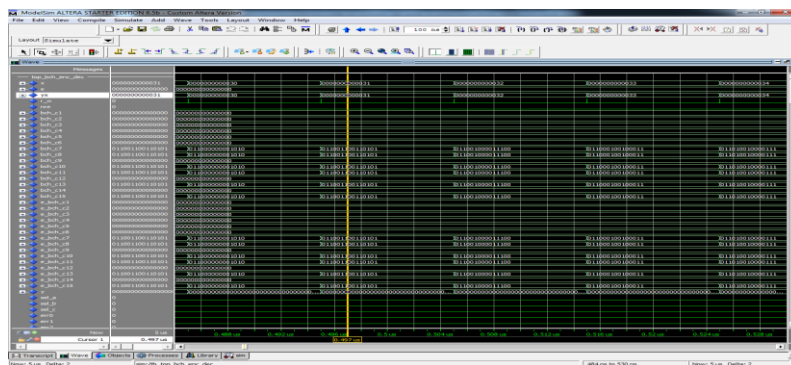
	Hamming Code (7,4)	BCH Code (15,7)
Number of Slice LUT	249	1147
Number of Occupied Slice	128	595

Number of IOB	41	98
Delay(ns)	30.725	67.336

Table1 : Area, Power, Delay And Memory Comparison

VI. CONCLUSION

In existing comparison of floating point ALU Design is not implemented a stochastic approaches using high cost in area and power. In contrary circuits size of a conventional multiplier quickly grows with n; 4x4 bit and 8x8 bit binary deterministic multipliers requires 100s and 1000s of gates, respectively. Despite this important advantages, stochastic computing could not become a real competitor to conventional computing except for few image processing applications not requiring high accuracy, low accuracy and related long computing times are main obstacles in front of SC .

VII.FUTURE ENHANCEMENT

In this Paper, approaching a new design of Stochastic and analysis of Dynamical digital computation in ALU using stochastic numbers, it overcome the main drawback in stochastic computing, low accuracy or related long computing times. It manipulates stochastic bit streams with the aid of feedback mechanisms. Accurate (error-free) arithmetic multiplier and adder circuits are implemented. Circuits are considering by performance parameters area, delay, and accuracy.

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Low Power and Accurate Complex Square Root Computation using Low-Complexity Methodology

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Abstract : In this brief, we propose a low-complexity methodology to compute a complex square root using only a circular coordinate rotation digital computer (CORDIC) as opposed to the state-of-the-art techniques that need both circular as well as hyperbolic CORDICs. Subsequently, an architecture has been designed based on the proposed methodology and implemented on the ASIC platform using the UMC 180-nmTechnology node with 1.0 V at 5 MHZ. Field programmable gate array (FPGA) prototyping using Xilinx' Virtex-6 (XC6v1x240t) has also been carried out. After thorough theoretical analysis and experimental validations, it can be inferred that the proposed methodology reduces21.15% slice look up tables (on FPGA platform) and saves 20.25%silicon area overhead and decreases 19% power consumption (on ASIC platform) when compared with the state-of-the-art method without compromising the computational speed, throughput, and accuracy.

Index Terms – **Complex square root, coordinate rotation digital computer (CORDIC), square root.**

I. INTRODUCTION

Complex numbers have been used significantly in scientific community for the real-time data representation and system modeling, including electronic circuits, electromagnetism, communication systems, and signal processing algorithms. The state-of-the-art architecture of complex square-root computation was designed using the Co-ordinate Rotation Digital Computer technique(CORDIC). The CORDIC techniques includes the process of both hyperbolic and circular CORDICs. The hyperbolic CORDIC techniques require more iterations to attain a same precision and accuracy of the output when compared to the circular CORDIC technique, and it is also more complex to computing and consumes more power. The CORDIC technique uses the concept of RCA adders for complex square root computation, but the CORDIC technique with RCA has high (CPD) carry propagation delay. Therefore the proposed design uses the concept of circular CORDIC technique with Vedic Multiplication and Division concept in order to attain a accuracy result and has less (CPD) Carry Propagation Delay. By using the Vedic Multiplier concept the number of steps required for calculating the product will be reduced and hence there is a reduction in a computational time and increase in speed of the multiplier. The circular

CORDIC technique with Vedic Multiplier and Divider uses the concept of doubly pipelining (DP) architecture in order to attain a speed of computing. The proposed system of circular CORDIC technique with Vedic Multiplier and Divider is evaluated in VHDL and synthesized in XILINX FPGA-S6LX9, and compared with area, power and delay.

II.   EXISTING SYSTEM

Complex numbers have been used significantly in scientific community for the real-time data representation and system modeling, including electronic circuits, electromagnetism, communication systems, and signal processing algorithms [1]–[6]. However, existing real valued square-root computation methods [7]–[13] cannot be used directly to compute complex square root without requiring additional hardware. On the other hand, the state-of-the-art architecture for complex square-root computation was designed using the coordinate rotation digital computer (CORDIC) involving two circular and one hyperbolic CORDICs. However, a hyperbolic CORDIC requires more iterations to obtain the same precision and accuracy when compared with a circular CORDIC, resulting in more computational complexity in terms of power consumption and silicon area overhead when implemented on chip [14]. Motivated by the fore mentioned facts, we introduce here in this brief a low-complexity methodology for computation of the complex square root using only two circular CORDICs unlike the state-of-the-art method where a hyperbolic CORDIC is also necessary.

III.   THEORETICAL BACKGROUND

Considering a complex $number\ z = p + jq$, conventional complex square root is computed as,

$$\sqrt{p + jq} = \sqrt{\sqrt{\frac{\sqrt{p^2+q^2}}{2}}} \qquad .... \quad (1)$$

The implementation of (1) requires three square roots and two multiplications [5], and also have the problem of intermediate overflows. An alternate method was provided in [6] to eliminate this flaw. However, it requires more computations including several tests. To avoid this computational complexity, a CORDIC-based architecture was introduced in [14] based on the following equation,

$$\sqrt{p + jq} = \sqrt{R}cos\frac{\psi}{2} + j\sqrt{R}sin\frac{\psi}{2} \quad .... \ (2)$$

where,

$$R = \sqrt{p2 + q2} \text{ and } \psi = \tan^{-1}\frac{q}{p} \qquad ....(3)$$

To compute on hardware, it requires two circular and one hyperbolic CORDICs. For paucity of page, detailed discussion on the CORDIC is omitted here. However, the fundamental working principle of a circular CORDIC is as follows.

$$\begin{pmatrix} x_f \\ y_f \end{pmatrix} = \begin{pmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{pmatrix} \begin{pmatrix} x_0 \\ y_0 \end{pmatrix} = \begin{pmatrix} Rot_x(x_0,y_0,\theta) \\ Rot_y(x_0,y_0,\theta) \end{pmatrix} \quad ....(4)$$

where$x0$, $y0$, andx_f, y_f are the initial and final components of the vector, respectively. Angle of rotation θ =Vec θ/x(x_0, y_0, xc/yc). Rot x/y (.) denotes the x/y component of the rotation-mode CORDIC output and Vec_θ/x(.) denotes the θ/x output of the vectoring mode CORDIC, equating one of the x_f/y_f co-ordinates with either of xc/yc, respectively. It can be noted that a hyperbolic CORDIC requires more iterations to obtain the same precision and accuracy when compared with a circular CORDIC [15], which results additional computational complexity in terms of area and computational speed.

IV.   PROPOSED ARCHITECTURE

The architecture designed based on the proposed methodology, as described in Section III-A. Here, unlike the state-of-the-art design [14], the proposed architecture has been implemented by reusing only the circular CORDIC, which eliminates the requirement of the hyperbolic CORDIC and makes the architecture less-complex. The detailed hardware complexity analysis is given
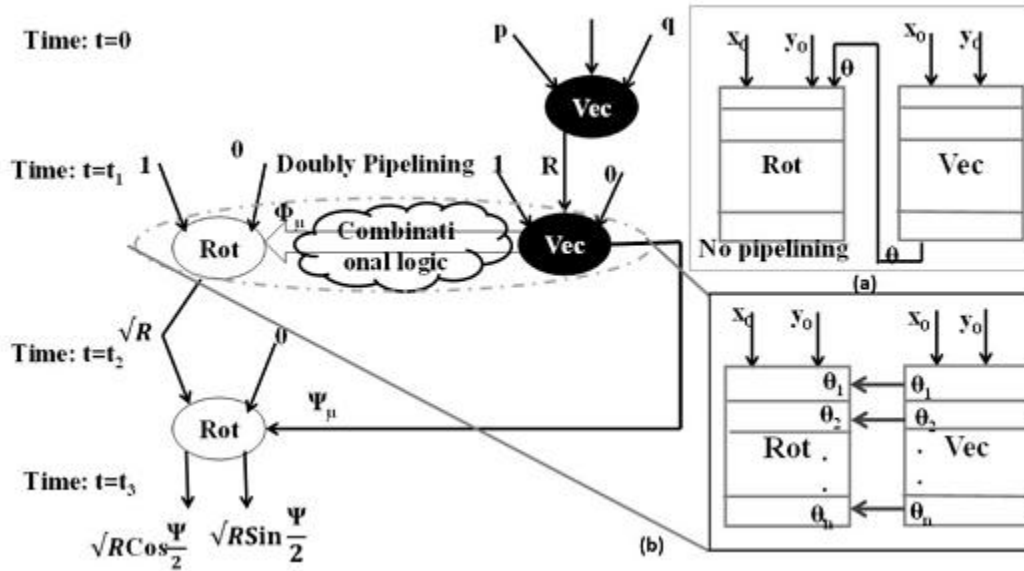
Fig. (a) Without pipelining. (b) Doubly pipelined architecture with a

detailed signal flow for the proposed methodology.

V.   RESULT ANALYSIS

AREA, POWER AND DELAY COMPARISONS

	Existing Complex Square root	Proposed Complex Square root
LUT	5592	1389

Slice Registers	1612	193
Max frequency	157.144	200
Delay(ns)	-	74.493
Power(mW)	-	38
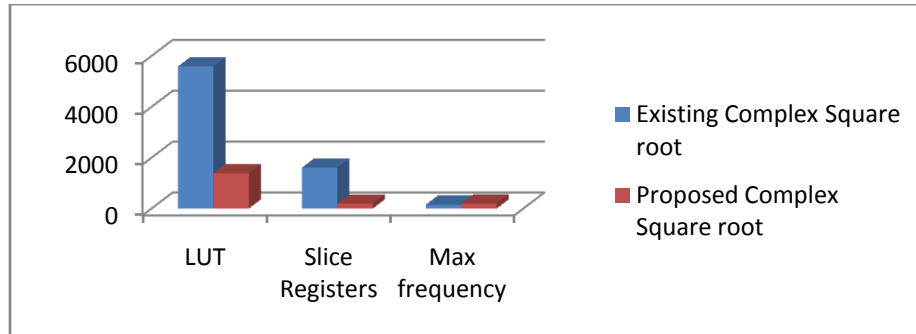
VI. CONCLUSION

In this brief, a low-complexity methodology to compute a complex square root using only circular CORDIC is proposed eliminat- ing the need of the hyperbolic CORDIC from the state-of-the-art architecture [14]. Subsequently, respective architecture has beendesigned using the DP technique and results have been validated using MATLAB, FPGA, and ASIC platforms resulting in saving of 20.25% on-chip area, 19.52% power consumption (ASIC), and 21.15% slice LUTs (FPGA) without compromising accuracy when compared with the state-of-the-art architecture.

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WSNO in Smart Cities Using M2M Protocol

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ABSTRACT-In this work focuses on the implementation of machine to machine (M2M) protocols as communications support for the integration of wireless sensor networks oriented to their use in the context of smart cities under the framework of the Internet of Things (IoT). This paper aims to show the integration of communication technologies that allow adapting this type of solutions to the IoT, this is carried out through the implementation of the FIWARE platform and the coupling to a WSN supported on Zigbee technology operating in API mode. In the document can be seen the block diagram of the proposed technological solution, configuration parameters and the development of tests to validate the operation of the installed platform.

Keywords: WSN, Middleware, Zigbee, Internet of Things

I.INTRODUCTION

It is not possible to talk about smart cities without leaving aside the technology of the Internet of Things (IoT), because this technology directly supports its vision and concept, seeking to generate a series of applications and services that improve the quality of life of citizens and even manage to substantially support the city administration processes [1]. However, this process involves the integration of heterogeneous technologies that generate a large amount of information to process and analyze [2], this is where it is necessary to develop technological solutions that serve as resource and information management systems that support this work.

Similarly, it must be taken into account that every day the number of elements that are connected to the web is increasing, not only referring to conventional mobile devices such as smartphones, tablets or PC. On the other hand, the increase of wireless sensor networks is growing day by day, its diverse applications are associated with intelligent parking systems [3], lighting controls [4], business systems and markets, home automation applications [5], sensors for prevention and detection of emergencies, precision agriculture [7], among many others. These multiple applications lead to the capture, transmission, processing and storage of a fairly high volume of information, generating a series of challenges to the processes of technological integration that must be carried out.

The objective of this paper is to show the technological integration carried out between producers and consumers of context in the framework of the Internet of Things (IoT). It is intended to describe the implementation associated with a WSN supported on Zigbee technology through its native protocol M2M in API mode and the coupling to a

FIWARE middleware platform, in order to provide a functional, adaptable and scalable solution to any requirement established by the functions of a WSN within the framework of an intelligent city.

II.METHODOLOGY

The proposed development consists of two functional stages, the implementation of the FIWARE NGSI platform and the integration of the wireless sensor network with Zigbee technology using its API protocol [10], see Fig. 1.
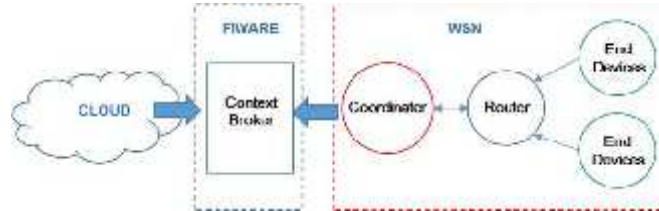
Figure 1: Block diagram of the proposed system.

III.FIWARE PLATFORM

FIWARE is an open source platform, which enables the connection and development of applications for smart cities, since it offers interoperability and standard data models. Likewise, "FIWARE provides means to produce, collect, publish and consume large-scale context information and exploit it to transform the application into a smart application"

Among the basic components for the development of internet applications of things are the following modules: Context data module, IoT module and Security module.

The aforementioned components allow the development of advanced interfaces, as well as the development of different applications that can be used by all the sensors that are connected to a specific platform. These components cover from the acquisition of data and the execution of commands at the level of physical devices, to the use of data from external applications.

FI-WARE architecture

FI-WARE is composed of elements called Generic Enablers, "GE", which enable the interaction between different sectors

[7], among which we can mention: Cloud Hosting, Data / Context Management, Internet of Things (IoT) Services Enablement, Applications / Services Ecosystem and Delivery Framework, Security and Interface to Networks and Devices (I2ND). The components of the FI-WARE architecture for IoT cover everything from the data acquisition and the commands execution at the level of physical devices to the data use from external applications, see Fig. 2.

Figure 2: FI-WARE architecture for IoT [9]

3.1 NGSI

NGSI is defined as a standard, which enables the connection or communication of the information generating devices and the consumer or client devices of this information with the Context Broker, through the "definition of the interfaces that a context manager must implement" [8]. NGSI, allows the standardization of the APIs implemented in the FIWARE architecture, through the definition of data models applicable to the management of context information, through the use of entities also defined by the Context Broker.

3.2 API Protocol Zigbee Modules

The construction of wireless sensor networks on Zigbee technology is widely favored when using its Xbee API Protocol. This way work API is oriented specifically to the communication between applications, in such a way that it is managed to guarantee a high efficiency both in the transmission of information, as in the habilitation of services between the diverse modules that are part of a network; in general terms, these types of interfaces are not designed for direct human interaction [10].

The implementation of the API Protocol involves the manipulation of a series of frames composed of a series of specific bytes from which all the functions of the Zigbee can be validated. Its basic structure is composed of: Start Delimiter, Length Bytes, Frame Data Bytes and Checksum. Some of the frame types of the API mode are: 0x08 AT command, 0x09 AT command (queued), 0x17 Remote Command Request, 0x8A Modem Status, 0x10 TX request, 0x92 RX I/O data received among many others [10].

IV.IMPLEMENTATION AND RESULTS

Oriented to the realization of a wireless sensor network, as part of the implementation should be considered the right platform, one of the best services coupled to the FIWARE platform is the Orion Context Broker. The implementation of this service will allow to provide information management in a robust manner. To do this, function programming is done through the FIWARE NGSI V2 standard, which allows structuring the data frame coming from the sensors and thus the manipulation of the information. All this in a context enabled for the subsequent implementation of visual interfaces in which the information can be presented in a more orderly way.

4.1 Orion Context Broker
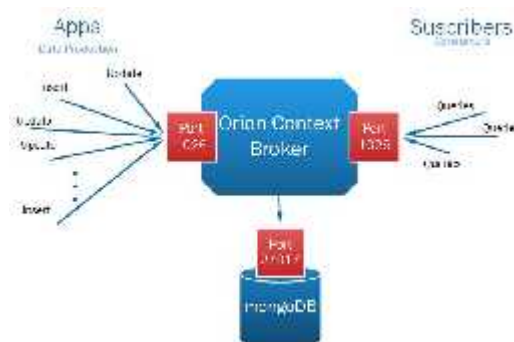
Figure 3: Flow of the Context Broker.

Fig. 3 shows the operational structure of the Orion Context Broker, its main components and the way in which it interacts. This component is one of the main elements within the FIWARE platform defined in the context of information, a service that can mediate and manage the sending and receiving of data under the definition of the NGSIv2 standard, implemented as a data model in the Context Broker. Thus, it considers the information as an element of the context called entity, to then administer the updates and query its attributes. The Context Broker would thus have a virtual representation of the physical devices, stored in mongoDB.

The Context Broker, is the component that within the FIWARE architecture governs the information of the data producers (sensors) and keeps them available for data consumers at their discretion (WEB applications, SmartPhone, other sensors, etc.). About this definition Orion Context Broker enables infinity of external applications oriented to the internet of things in an easy and efficient way, summarizing all existing tasks in the complexity of the capture and information administration. The context broker defines two operations based on the persistence of information for producers and consumers:

publication of entities and their attributes when dealing with information sent by producers, this task is interpreted in the Context Broker as an update of the context (updateContext).
reading of entities and their attributes when a request for reading (queryContext) is sent from consumers.

All this context information is robustly handled in large amounts of entity messages, by the Orion Context Broker, the operations of the producers and consumers are structured by the specification of the standard or REST interface, through which data is obtained or there are generated operations on them in various possible formats, within the most well-known XML and JSON, thus allowing a simple manipulation of the data.

4.2 Installation of Orion Context Broker The resources for the installation are:
 -Virtual Box version 5.1.30
-Virtualized service [9]

Figure 4: Verification of connection to database.

The virtual machine downloaded in Virtual Box must be imported, enabling all the permissions to communicate by network with the host computer. When starting the virtual machine, it must be identified before the operating system with the fiware username and password.

Fig. 4 shows the process to be performed even from the start of the guest operating system, to verify connectivity to the database. In step 1, the user is identified in the system based on specified credentials. In step 2 the "mongo" command is executed in order to know if the context has connectivity to the mongoDB database of the Context Broker, and if the connection is satisfactory the system enters the mongo shell and returns the version used (in this case 2.6.11) and the name of the instance with which the connection was achieved, in this case and by default: test. Finally, in step 3 it is executed the "show dbs" command, so the response describes the databases available in the mongoDB instance, in this case orion for the operation of the broker context. To exit the mongo shell the "exit" command is executed.
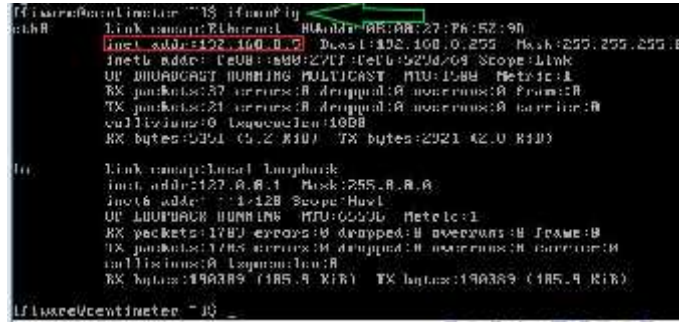
Figure 5: Verification of connection to database.

Table 1 shows the descriptors associated with the verification of service availability, see Fig. 6.

Figure 6: Confirmation of the execution of the Orion Context Broker.

Table 1: List of descriptors

<version>	Describes the version of the Orion Context Broker service that is running.
<uptime>	Describes the time of high in the service for each instance, that is, the execution time since the system started.
<git_hash>	Verification of the compilation hash in the FIWARE GIT repository
<compile_time>	Date of compilation of the version.
<compiled_by>	Author of the compilation of the version.
<compiled_in>	Version compilation system.

At this point the platform would be correctly configured and available to perform the requests for creation, update, query and deletion of entities in the data context of the FIWARE platform.

4.3 Basic functions programming

The basic functions on any data consist in the creation, updating, elimination and consultation of the records in a system.

Defined as an API, which is implemented in the Visual Studio 2015 development environment and with Python 3.6 programming language on the host computer and based on the FIWARE NGSI standard to make requests to the Orion Context Broker. These requests are made through REST calls in JSON format. Next, the structure of the project and initialization of parameters in the file config.ini is observed, facilitating the modification of these without intervening the source code of the solution.
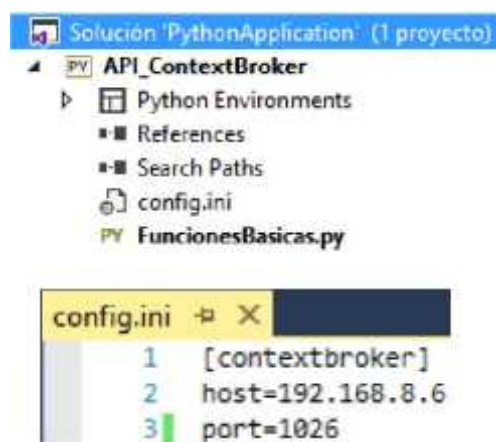
Figure 7: Structure of the project in VS 2015

4.4 Implementation

The following libraries must be imported into the source code:
Request, Json and Configparser.

1. Reading of INI file

In this way the host and port variables are defined and initialized. They will keep this value in the API execution time and will be used to make the REST calls to the guest host where the Orion Context Broker is in service, see Fig. 8.

Figure 8: Reading configuration parameters

2. Defining the JSON format

In Fig. 9 it can be seen 4 methods that meet the definition of the FIWARE NGSI standard. In number 1, a list of attributes is defined, depending on the type of data. Method number 2 defines the structure for the insertion of entities, there the attrib parameter references a list of attributes generated in method number 1. Method number 3 defines the structure for updating entities, the attrib parameter references a list of attributes generated in method number 1. Method number 4 defines the assignment of values to entities, and can be used both in the creation and updating of entities.

Figure 9: JSON structure implementation

3. Defining the basic functions under the FIWARE NGSI standard
✓

Consulting entities:

Figure 10: FIWARE NGSI – Query structure implementation

Figure 10 shows the method of consulting entities to the Orion Context Broker. In compliance with the FIWARE NGSI standard and depending on the value of the entity parameter, the execution of this method will return the list of all the entities stored or a specific entity:

The result of Figure 11 has the JSON format, widely known and implemented for the presentation of data in different user interfaces, such as web applications, mobile applications or desktop applications

Figure 11: Querying stored entities

✓

   Inserting entities:

Figure 12 shows the method of inserting entities into the Orion Context Broker. In compliance with the FIWARE NGSI standard, the execution of this method will return the result of the transaction using JSON response code. Code 201 will report successful registration, code 200 registration failed.

Figure 12: FIWARE NGSI - Insertion structure implementation

V. CONCLUSIONS

The FIWARE platform was configured in the framework of the internet of things, the solution successfully integrated the context or entities management service; In a structured manner, the steps to be followed for configuring and staging the service are represented, showing several outstanding aspects and capabilities that can be expected from the platform. One of the most complex phases of the present project was the understanding as such of the FIWARE platform and the configurations or enablers to be used according to our need to manage the information obtained by a sensor network..

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IOT Automation for Waste Collection in Smart City

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Abstract—Urban solid waste prevention and recycling are needed at the local scale rather than heavily relying on the treatment and disposal at the regional scale. Differentiated collection is necessary but complicates the current schemes of waste collection of sustainable waste management. The proposed SGS is able to gather the massive volumes of data and information from different application scenes of waste separation and differentiated collection, with the aid of sensor network technologies and Raspberry pi timely detect state parameters throughout a waste collection system and the rate of waste separation and recycling. In-network data processing and cloud computing contribute to managing the communications among all collection nodes, vehicles, and crews in a secure, scalable and highly-available environment. The proposed SGS can deal with well-structured, semi-structured, and even poorly structured .problems in a more efficient, collaborative, and resilient way with the aid of a position-navigation-timing system. Integrated three-level SGS architecture with a scalable sensor network is proposed in this study as an instruction of developing SGS for sustainable waste management.

Keywords—Internet-of-Things; Smart city; Environmental information system; Waste separation; Differentiated collection.

1.INTRODUCTION

Population increase and migration from rural areas to urbanized regions have resulted in the sustainable growth of urban solid waste. To improve resilience, waste separation and recycling are needed at the local scale rather than heavily relying on the treatment and disposal at the regional scale. Waste separation at source node will help to implement an easy and efficient and recycling sub-system leading a huge reduction of post effort . It is proved as an effective option for waste minimization in many developed countries such as Japan, Germany, Sweden, Spain, and the U.S. China has begun to introspect the pattern of waste management since two decades ago when the problem of improper disposal and the rapid expansion of waste incineration brought citizens strong warnings and criticisms.

management is December, 2017, when China's president proposed to implement a nationwide plan of waste separation with enough resilience to waste growth and high sustainability to life satisfaction. From this moment on, national and local policies and guidelines related to waste separation have been issued. In actual fact, waste separation and differentiated collection complicate the current schemes of waste collection, because more types of containers are needed, and vehicles must deal with various types of waste streams. To construct an efficient, effective, and sustainable scheme of waste collection, informatics

methods has been coming onto the market in the waste collection sector. Various kinds of sensors were proposed for monitoring the filling level and weight of waste bin, in order to avoid unnecessary collection trips and make the collection smart. Sonar based sensors can be mounted at th

bottom of a bin to detect the filling level. Image recognition with the aid of cameras can get this functionality as well. However, they are expensive techniques. As an alternative, electricity based sensors such as apacitive sensors can be mounted at the bottom of a bin to detect the filling level. An capacitive sensor consists of two low-cost electrodes imply low power consumption, which is a desirable characteristic in sensor networks . However, this kind of sensor is only suitable for insulative materials such as waste paper and glass bottles but not suitable for conductive materials such as metal cans and food waste, because it is so sensitive . Another alternative option is using photoelectricity based sensors. Infrared light-emitting diodes mounted under the lid of a bin and photodiodes in the opposite side can be combined to achieve the detection . The surfaces of these emitters and detectors should be kept clean, so as to prevent interference.

ALGORITHM

"Backtracking search algorithm in CVRP models for efficient solid waste collection and route optimization" modified Backtracking Search Algorithm (BSA) in capacitated vehicle routing problem (CVRP) models with the smart bin concept to find the best optimized waste collection route solutions.such system based on the **DIJKSTRA'S ALGORITHM .**

2.1 DIJKSTRA'S ALGORITHM

Dijkstra's algorithm, conceived by computer scientist Edsger Dijkstra in 1956 and published in 1959, is a graph search algorithm that solves the single-source shortest path problem for a graph with non-negative edge path costs, producing a shortest path tree. This algorithm is often used in routing and as a subroutine in other graph algorithms. For a given source vertex (node) in the graph, the algorithm finds the path with lowest cost (i.e. the shortest path) between that vertex and every other vertex. The worst-case running time for the Dijkstra's algorithm on a graph with nodes and edges is because it allows for directed cycles. It even finds the shortest paths from a source node to all other nodes in the graph. This is basically for node selection and for distance update
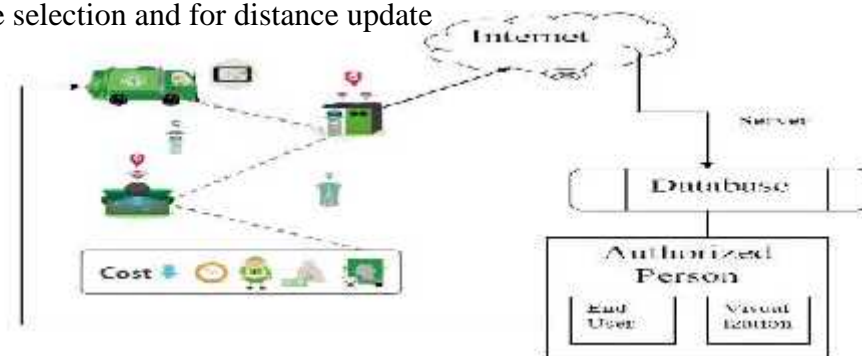
III. MODULES DESCRIPTION

There are three modules using in this project.
- ❖ Administrator module
- ❖ Municipal authority module
- ❖ Garbage collector driver module

3.1 ADMINISTRATOR MODULE

The administrator module which used by main administrator of single user to control all functionalities and controls the permissions of different users.which can be provide access to new users in other modules.

3.2 MUNICIPAL AUTHORITY MODULE

Used by the Authority of Municipal Corporation. Can view the GUI based level of garbage in the dustbin. municipal authority can view the map view status of the dustbins .Can view the dustbin details
– dustbin ID, threshold value, location .Can view the details of all the drivers located in their area .which

3.3 GARBAGE COLLECTOR DRIVER MODULE

Used by the drivers on their smartphones .Can view the map view status of the dustbins .Garbage collector driver module can view the dustbin details – dustbin ID, threshold limit, location .Informed through text message when threshold limit exceeds.

IV.CONCLUSION

A SGS is developed in this study in order to promote waste separation and differentiated collection.This elaborated system uses sensors, artificial intelligence, and optimization models of vehicle routing.Improving proper waste management will reduce pollution, recycle useful materials and create more green energy. We have implemented real time waste management system by using smart dustbins to check the fill level of smart dustbins whether the dustbin are full or not. In this system the information of all smart dustbins can be accessed from Anywhere and anytime by the concern person and he/she can take a decision accordingly. By implementing this proposed system the cost reduction, resource optimization, effective usage of smart dustbins can be done. This system indirectly reducing traffic in the city. In major cities the garbage collection vehicle visit the area's everyday twice or thrice depends on the population of the particular area and sometimes these dustbins may not be full.

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Information Security of Applications in Internet Of Things(IOT)

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Abstract - The Internet of things(IOT) is heavily affecting our daily lives in many domains, ranging from tiny wear-able devices to large industrial systems. Consequently, a wide variety of IOT applications have developed and deployed using different IOT frameworks. An IOT framework is a set of guiding rules, protocols and standards which simplify the implementation of IOT applications. The success of these applications mainly depends on the ecosystem characteristics of the IOT framework, with the emphasis on the security mechanisms employed in it, where issues related to security and privacy are pivotal. In this paper, we survey the security of the main IOT frameworks, a total of 8 frameworks are considered. For each framework, we clarify the proposed architecture, the essentials of developing third-party smart apps, the compatible hardware, and the security features. Comparing security architectures shows that the same standards used for securing communications, whereas different methodologies followed for providing other security properties.

I.INTRODUCTION

The Internet of Things (IOT) plays a remarkable role in all aspects of our daily lives. It covers many fields including healthcare, automobiles, entertainments, industrial appliances, sports, homes, etc. The pervasiveness of IOT eases some everyday activities, en-riches the way people interact with the environment and surroundings, and augments our social interactions with other people and objects. This holistic vision, however, raises also some concerns, like which level of security the IOT could provide? and how it offers and protects the privacy of its users? Developing applications for the IOT could be a challenging task due to several reasons; (i) the high complexity of distributed computing, (ii) the lack of general guidelines or frameworks that handle low level communication and simplify high level implementation, (iii) multiple programming languages, and (iv) various communication protocols. It involves developers to manage the infrastructure and handle both software and hardware layers along with preserving all functional and non-functional software requirements. This complexity has led to a quick evolution in terms of introducing IOT programming frameworks that handle the aforementioned challenge Background.

1.1AWS IOT

 AWS (Amazon Web Services) IOT is a cloud platform for the Internet of things released by Amazon. This framework aims to let smart devices easily connect and securely interact with the AWS cloud and other connected devices. With *AWS IOT* , it is easy to use and utilize various AWS services like Amazon Dynamo DB , Amazon S3 , Amazon Machine Learning , and others. Furthermore, *AWS I) IOT* allows applications to talk with devices even when they are offline.

II.ARCHITECTURE

   The *AWS IOT* architecture consists of four major components: the *Device Gateway* , the *Rules Engine* , the *Registry* , and the *Device Shadows* . The *Device Gateway* acts as an intermediary between connected devices and the cloud services, which allows these devices to talk and interact over the MQTT protocol. In spite of being an old protocol, in comparison with other IOT protocols, Amazon uses MQTT due to several features; (i) fault tolerance property, (ii) excellent for intermittent connectivity, (iii) small footprint in terms of the space needed in the device memory, (iv) very efficient in terms of the network bandwidth requirements, and (v) depends on the publish/subscribe programming model to allow one-to-many communication between various devices . The latter feature means that sensors and other embedded devices that are moving and talking to the *Device Gateway* do not need to know who is sending data to them. They just send the data route and those who subscribe to the data will receive it. This enables a scalable environment for low-latency, low-overhead, and bi-directional communication. Under the hood, the *Device Gateway* is built in a fully managed and highly available environment controlled by the community of Amazon in order to simplify the development of applications and provide unified security measures to all users. (.*Transport Layer Security*), the successor of SSL (*Secure Socket Layer*) [28] . Further- more, the *Device Gateway* supports Web Sockets and HTTP 2 Using *Device Shadows* as discussed later in the Architecture.
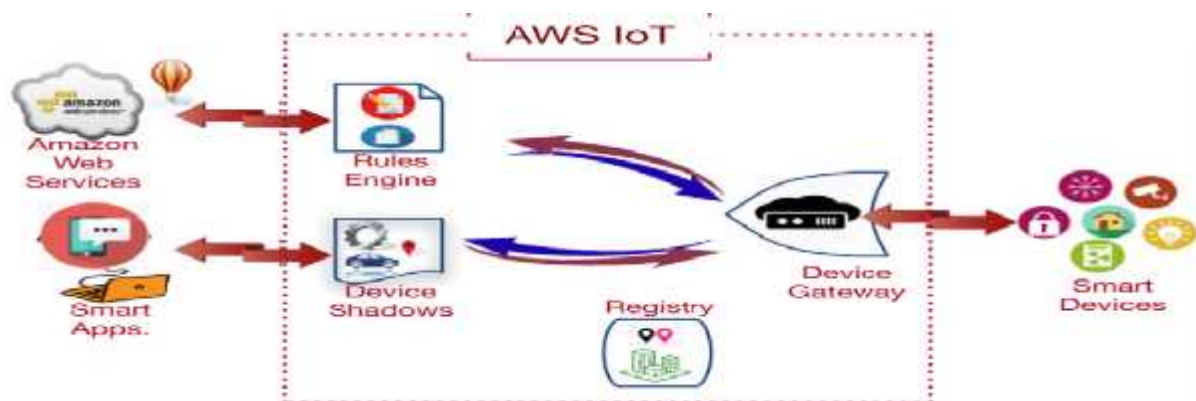
Users can use various platforms (e.g. mobiles, laptops, etc.) to interact with their cloud-connected IOT devices via REST APIs. In general, there are two types of smart applications in *AWS IOT: companion* and *server* apps. The latter are de- signed and implemented to monitor, manage, and control a large number of connected devices at the same time. An

example of a server application would be a fleet management website that plots thousands of trucks on a map in real-time. Companion apps are mobile or web-based applications that allow end-users to inter- act with their cloud-connected devices. As stated previously, companion and servers apps can access and communicate with *device shadows* in the cloud via uniform Restful APIs.

2.1ARM mbed IOT

ARM mbed IOT is a platform to develop applications for the IOT based on ARM microcontrollers. It provides all requirements through it' s ecosystem to build either an IOT standalone applications or networked ones . *ARM mbed IOT* platform aims to provide scalable, connected, and secure environment for IOT devices by integrating mbed tools and services, ARM microcontrollers, *mbed OS, mbed Device Connector* , and *mbed Cloud* . *ARM mbed IOT* framework has the advantage over the vast majority of frameworks by providing a common OS foundation for developing IOT. It supports the most important communication protocols for connecting devices with each others and with the cloud. Furthermore, it supports automatic power management in order to solve the power consumption problem.

2.2 ARCHITECTURE

The key building blocks of the *ARM mbed IOT* platform are *mbed OS, mbed client library, mbed cloud, mbed device connector* , and hardware devices based on ARM microcontrollers. The *mbed OS* represents the backbone of this platform. Therefore, discussing it' s architecture helps in simplifying the architecture of the *ARM mbed IOT* platform and clarifying it. ARM *mbedOS* is an open source and full stack operating system designed for embedded devices, specifically, ARM Context- M microcontrollers, used to power smart homes and smart cities. It is built in a modular fashion, so that developers can use it their needs from its modules. The *mbed OS* represents the device-side component and stands on the top of a device security module, called *mbeduVisor.*
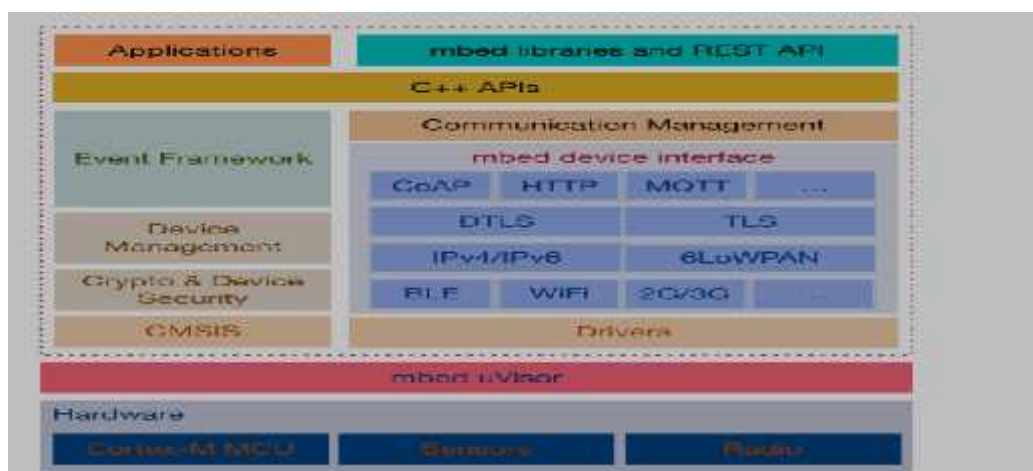
2.3 BRILLO/WEAVE

Google released *Brillo/Weave* platform for the rapid implementation of IOT applications. The platform consists of two main back- bones: *Brillo* and *Weave*. *Brillo* is an android-based operating system for the development of embedded low power devices, whereas *Weave* acts as a communication shell for interactions and message-passing purposes. The main role of *Weave* is to register a device over the cloud and send/receive remote commands. Both components complement each other and together form the IOT framework. *Brillo/Weave* is mainly targeting smart homes and expanding to support general IOT devices.

2.4 ARCHITECTURE

An overview of the architecture of *Brillo/Weave* framework, which includes two sub-architectures belonging to *Brillo* and *Weave* respectively. *Brillo* is a light-weight embedded operating system based on Android stack and fully implemented in C/C++ programing languages. It does not support any Java framework or runtime. The bottom layer represents the platform of IOT devices. The *Kernel* layer is located at the top of the *Hardware* layer. It is Linux based and it has the responsibility to provide basic architectural model for managing system resources, process scheduling, communication with external devices when needed and so on. Also, It provides drivers and libraries to control displays, cameras, power, WiFi, keypads, and many other resources over the physical device. However, no graphics or GNU libraries are supported. The *android HAL* (Hardware Abstraction layer) is a middleware, which bridges the gap between the hardware and the software. *Smart applications specifications Weave* comes with a mobile SDK for both iOS and Android to build apps to control and enhance the connected device experience for mobile users. Any Android- or iOS-based mobile phone can run smart apps able to talk to Brillo-powered embedded devices. The smart app should include the *Weave* SDK as a communication module. In general, third party developers can implement applications in any platform using any programming language supports *Weave* . On the other side, IoT devices should run *Brillo* in order to interact with smart apps with no further requirements. Currently, only Google Cloud supports *Weave* and no other professional cloud (e.g. Amazon, Microsoft, etc.) does that.
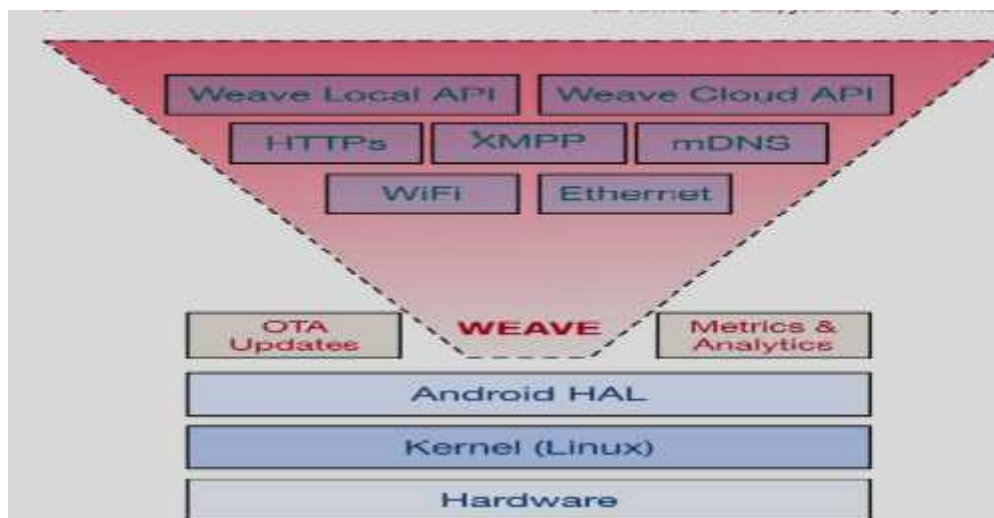
2.5 Calvin

Calvin is an open source IOT platform released by Ericsson . It is designed for building and managing distributed applications that enable devices talk to each others. *Calvin* is a framework that applies *Flow based Computing* (FBP) paradigm methodologies over the well-defined *actor model* .

2.6 ARCHITECTURE

The high level architecture of *Calvin* . The two bottom layers compose a foundation for the runtime environment . The base layer represents the hardware or the physical device, whereas the second one encapsulates the operating system that the hardware exposes. At the top, the *platform dependent runtime* layer of *Calvin* takes a place. In this layer, all kinds of communications between different runtime environments (e.g. IOT devices) are handled. Also, this layer provides an abstraction of the hardware functionality (e.g. I/O operations). In other words, this layer sup- ports several transport layer protocols (WiFi, BT, i2c) and presents. *4.5.2. Smart applications specifications Calvin* framework divides the development process of an application into four pipelined isolated steps, each step has its own functionality as explained in the following : **Describe:** the functional part of any application which consists of reusable components or blocks called *Actors* . An actor is a component representing any object doing a computation e.g. smart phone, cloud, client, server, and etc. The way of communication between actors is by passing tokens over predefined ports. This is the only way to affect the behavior of an actor and change its state. Data is processed on the input ports of actors and then passed to the output ports in order to fire some actions depending on the contents of messages/tokens. Thus, writing an actor means identifying a new component THAT can be used in several locations by multiple applications. An actor can be created by (i) describing its actions, (ii) defining its input/output ports, (iii) identifying conditions for each particular action to be triggered, and (iv) adjusting the priority orders between actions. **Connect:** In this interaction step, information about how actors are connected is supplied in a simple way using *CalvinScript*, a declarative language used to describe applications and how actors connected inside them. At the end of this phase, the application is completely identified and ready for deployment. **Deploy:** after completing the

two former steps, the deployment phase takes a place in order to run the application in reality. The core of this step is the lightweight distributed runtime that pro- vides a number of accessible nodes for deployment and actors executions. Once the runtime environment is ready for execution after passing the application script to it, the distributed execution environment can move actors to any accessible runtime based on several factors such as resource, locality, connectivity, or performance requirement. **Manage:** it monitors the life cycle of the application. Furthermore, it is involved in keeping track of the resource usage, firmware updates, error recovery, and scalability. In order to support multiple programming languages and plat- forms, the design of *Calvin* does not require a specific way of processing data inside different actors. Only the format of data passed between ports is standardized.

2.7 HomeKit

*HomeKit*is an IOT framework released by Apple . It is a platform dedicated only to home-connected IOT devices. It facilitates the process of managing and controlling connected accessories and appliances in a user' s home by enabling interaction via smart apps. Through their own iOS devices, using the *HomeKit*app, called *Home* , users can discover, configure, control, and manage all *HomeKit*connected devices in a secure way. Furthermore, users can create actions and trigger their IOT devices using *Siriservice*. Until the moment of writing, iOS, watchOS, and tvOS are the only operating systems supporting the *HomeKit*capabilities.

2.8 ARCHITECTURE

The core components of *HomeKit*architecture are: the *HomeKit*configuration database, *HomeKit*Accessory Protocol (HAP), *HomeKit*API, and the *HomeKit*-enabled devices. Simplifies the *HomeKit*architecture. The IOT devices (accessories) are located in the base layer. However, not all home- connected IOT devices can integrate with the *HomeKit*platform directly. They should meet some conditions as explained later in the hardware specifications section. Accessories that do not satisfy *HomeKit*requirements are still able to connect to the *HomeKit*platform using intermediate devices called *Bridges. HomeKit Bridges* are gateways that act as a proxy between iOS applications and home automations that do not support the *HomeKit*protocol. At the device side, the bridge supports only ZigBee and Z-Wave protocols. The application layer resides at the top of the architecture. It is responsible for providing a consistent user interface to all Apple devices sharing the same account, by synchronizing the stored data in the shared database using iCloud . With tvOS10 , Apple extended the capabilities on the Apple TV and *HomeKit*by bringing the *HomeKit*framework to the tvOS.

III. CONCLUSION

The IOT market is growing rapidly and as a consequence the attention has shifted from proposing single IOT elements and protocols towards application platforms in order to identify frame- works supporting the standard IOT suites of regulations and protocols. This study has covered a subset of commercially available frameworks and platforms for developing industrial and consumer based IOT applications. The selected frameworks have the same design philosophy in terms of identifying cloud-based applications by centralizing distributed data sources. However, they followed various approaches in order to apply this philosophy. A comparative analysis of the frameworks was conducted based on the architecture, hardware compatibility, software requirements, and security. We highlighted on the security measures of each framework as verifying the various security features and immunity against attacks is one of the most important contemporary issues facing the Internet of Things.

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Automatic Movable Platform for Railway Track Crossing

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Abstract -The proposed system is used for the passenger who can be able to reach one platform of the railway station to the other without use of staircase steps and excavators. The system consists of movable platform which connects the two platforms of the railway station. Sensors are placed on the two sides of the railway station. If the train arrives at one end of railway station, the sensor network indicates the movable platform through Zigbee protocol with the help of Arduino microcontroller then the movable platform will automatically close. When the train departures the station, the other end of sensor network indicates the movable platform through Zigbee protocol with the help of Arduino microcontroller then the movable platform will automatically open. Then the passenger who can be able to reach one platform of the railway station to the other using movable platform.
Keywords-Zigbee protocol,Arduino microcontroller.

1.INTRODUCTION

The present railway systems in India are not automated which are fully manmade. In railway stations normally we use bridges. It is very difficult for the elderly persons or handicapped persons to use the bridge.There are several problems due to current platform system. Climbing stairs to foot over bridge for changing platform is one of the major issue every one faces during the beginning and end of the rail journey. Everyone wishes the arrival and dispatch of a train from platform No. 1 without requiring climbing stairs. For Senior Citizen and differently abled, it is certainly a painful experience.Even for normal person, pain of climbing stairs with handful of luggage is visible on their faces. Certainly, Indian Railways is looking for provision of escalators and lifts, but there is lot that should have also been done while providing stairs.There are many incidences when the platform of the train changed to PF 1 when VVIP has to board a train. There was a funny instance when platform of Rajdhani train changed to PF, but in return the coach guidance board started indicating wrongly. The VVIP along with family members had to travel a distance of 400 meter running along with luggage. In view of few accidents due to stampede at FOB, no one now dares to take such action.

Figure 1.1 Difficulties due to stair case in Railway station

II.PROPOSED SYSTEM

2.1 Objective

The proposed system is used to help the Indian Railways. It implements the movable platform between the railway tracks. It may be helpful for both handicapped and elder citizen people.

2.2 Transmitter Section

The block diagram of the transmitter section is shown in the Fig 2.2 In the transmitter section the IR sensor is used to detect the arrival of train and pass the signal to the arduino.
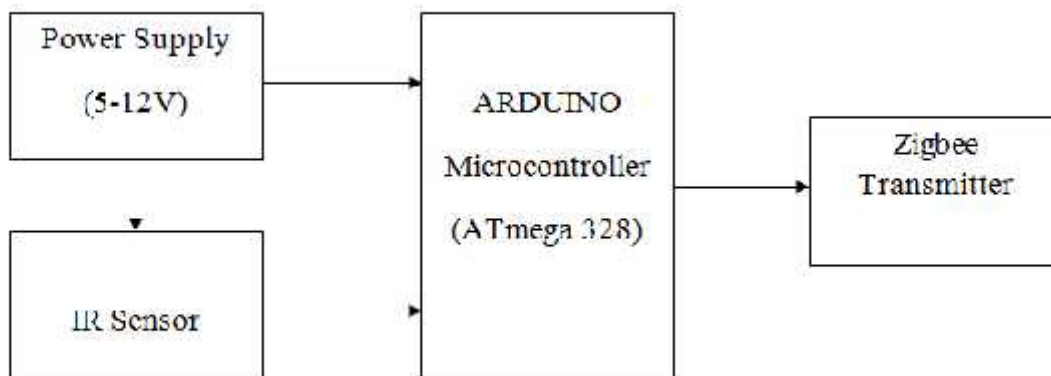
Figure 2.2 Transmission of signal using Zigbee module

Then the arduino gives the signal to the zigbee transmitter to transmit the data. The transmitted data is in the digital form either 0 or 1 (LOW or HIGH). If the input of the zigbee is high, it will transmit the data otherwise the zibee transmitter will not send any data to the receiver.

2.2.1 IR sensor

This IR sensor is used to detect the train and sends the signal to the arduino. It can be designed with the help of Proteus simulation software. Then it can be implemented in the pcb board.

2.2.2 Receiver Section

In the receiver section the solar panel is used as the power supply. The output of the solar panel volts and it is stored in the battery. The zigbee receiver receives the signal and gives that signal as input to the arduino. The arduino acts as the controller for the motor. Whenever the zigbee receiver receives the signal the motor will run. The movable platform is connected to the motor.
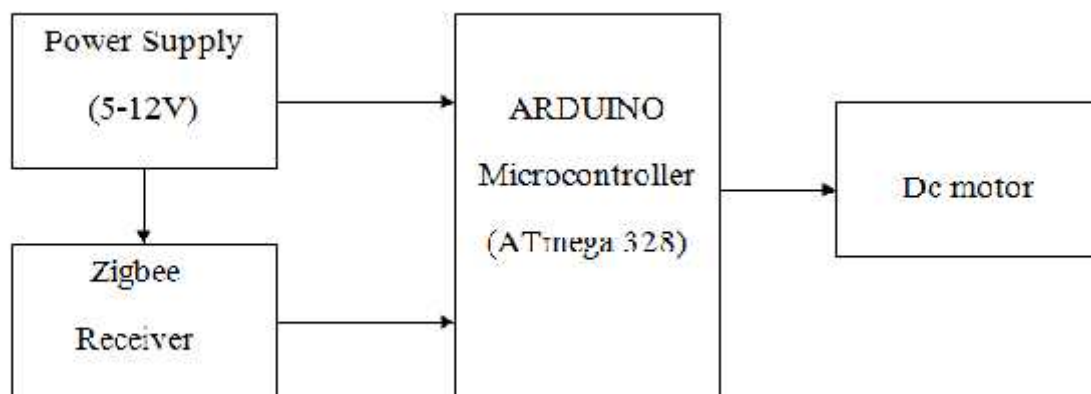
Figure 2.3 Reception of signal using Zigbee module

2.3.1 Solar Panel

Solar panel refers to a panel designed to absorb the sun's rays as a source of energy for generating electricity or heating. A photovoltaic (PV) module is a packaged, connect assembly of typically 6×10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications. Each module is rated by its DC output power under standard test conditions (STC), and typically ranges from 100 to 365 watts. The efficiency of a module determines the area of a module given the same rated output – an 8% efficient 230 watt module will have twice the area of a 16% efficient 230 watt module. There are a few commercially available solar modules that exceed 22% efficiency and reportedly also exceeding 24%. A single solar module can produce only a limited amount of power; most installations contain multiple modules. A photovoltaic system typically includes an array of photovoltaic modules, an inverter, a battery pack for storage, interconnection wiring, and optionally a solar tracking mechanism.

III. CONCLUSION

The IR sensor module will successfully detect the movement of train by using the delay of 10sec which helps the sensor module to efficiently identify the whether the object is human or a train. The output from the IR sensor signal is given to arudino. By interfacing the arduino with zigbee it is able to transmit and receive signals on both side. With the help of this module it is able to automatically connects the platform when the absence of train and removes the platform when the commencement of train with an alert information. Thus this method paves easy way for the passengers to cross the platform with less effects.

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Effusion Resilient Leveled Of Vertical Server On Suppressed Bit Of Data In Online Transactions

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Abstract— The use of credit cards has increased, because of a rapid advancement in the electronic commerce technology. The credit card becomes the most popular type of payment for both online as well as regular purchase, cases of credit card fraud also increasing. In Modern day the fraud is one of the major effects of great commercial losses, not only for merchants, the individual clients are also affected. Credit cards are used for purchasing goods and services with the help of virtual card and physical card whereas virtual card for online transaction and physical card for offline transaction. As credit card becomes the most popular mode of payment for both online as well as regular purchase, it provides cashless shopping. In the existing credit card fraud detection system, fraudulent transaction will be detected after transaction is done. It is difficult to find out fraudulent and regarding loses will be barred by issuing authorities. So in this paper we can implement three level server systems to partition the intermediate gateway with improved security. User details, transaction details and account details are considered as sensitive attributes and stored in separated database. And also implement data suppression scheme to replace the string and numerical characters into special symbols to overcome the traditional cryptography schemes. Experimental results shows that proposed scheme provide improved security and implemented in real time transaction databases

Index Terms—Data security, Credit card transactions, Cryptography scheme, Vertical server, Data suppression

I. INTRODUCTION

Credit card frauds are increasing day to day as the use of credit card is increasing. Instead of various fraud detection techniques fraudsters are so expert that they finding new ways for committing fraudulent transaction. Occurrence of credit card fraud has increased dramatically both online and offline. Credit card based purchase can be done in two ways: (i) physical card (ii) virtual card. In physical card purchase, the cardholder presents his card physically to the merchant for making payment. For this type of fraud attacker has to steal the credit card. In virtual card purchase only the information about the card is stolen or gathered like card number, secure code etc. such purchases are done over an internet. For these type of fraud attacker needs only card details so only way to detect these type of fraud is to analyze the spending pattern of card holder.

1.1 FRAUD TECHNIQUES

Various types of fraud techniques are as follows:

A. Site Cloning

In site cloning the fraudster clone an entire site or just the payment page of the site where customer make a payment. Customer feels that they are viewing the real site. The customer handover a credit card detail to the fraudster and then fraudster sends the customer a transaction receipt via email as

real site. Thus fraudsters have all detail of customer credit card so they can commit fraud without customer's awareness.

B. Stolen / Lost Credit Card

When customer card is lost or stolen by fraudster he gets all the information of the cardholder in the easiest way without investing any modern technology. It is difficult form of credit card fraud to detect.

C. Skimming

Skimming is one of the popular forms of credit card fraud. It is a process where the actual data on a card is electronically copied to another. It is very difficult for cardholder to identify this type of fraud.

D. Credit Card Generator

In credit card generator the computer program generates the valid credit card number and expiry gate. This generator creates a valid credit card highly reliable that it looks as the valid credit card number only and are also available for free download off the internet.

E. Phishing

In phishing the fraudster sends lots of false email to card holder. The e-mail looks like they came from the website where the customer trust for example customers bank. The email asks the customer to provide personal information like credit card number. With the help of these details fraudster commits crime.

F. Internal Fraud

The employee or owner access customers detail. The steal the customer's personal information to commit crime or pass on the information about cardholder to fraudster for money.In the commercial practice a large-scale data-mining techniques can improve on the state of the art. The scalable techniques to analyze massive amounts of transaction data that powerfully compute fraud detectors in a timely manner is an important problem, especially for e-commerce. Moreover scalability and efficiency, the frauddetection job exhibits technical difficulties that include slanted distributions of training data and non-uniform cost per error, both of which have not been usually studied in the knowledge-discovery and data mining community. The basic credit card fraud detection can be shown in fig 1.
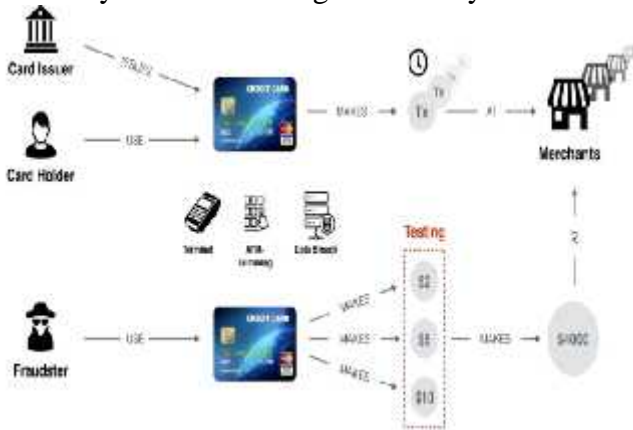
Fig 1: Credit card fraud

II. RELATED WORK

NusratJabeen, et.al,..[1] analyzed Improved Secured Association Rule Mining (ISARM) which is introduced for the horizontal and vertical segmentation of huge database. Then k-Anonymization methods referred to as suppression and generalization based Anonymization method is employed for privacy guarantee. At last, Diffie-Hellman encryption algorithm is presented in order to safeguard the sensitive information and for the storage service provider to work on encrypted information. The Diffie-Hellman algorithm is utilized for increasing the quality of the system on the overall by the generation of the secured keys and thus the actual data is protected more efficiently. Realization of the newly introduced technique is conducted in the java simulation environment that reveals that the newly introduced technique accomplishes privacy in addition to security. The way in which data is partitioned hails to be one among the most vital factors in distributed data mining. Many algorithms on a majority

are designed and evolved based on the data partitioning concept. Usually, two kinds of data partitioning exist, namely vertical partitioning and horizontal partitioning. In the case of vertical partitioning, the data that is available is stored at various geographical locations, for instance, assume that in a data mining process, a variety of data like corporate, medical, insurance, hospital, school and housing data have to be collected about various persons who live in the modern city.

DediGunawan, et.al,…[2] propose a new data anonymization scheme, called sibling suppression, which causes minimum data utility lost and maintains data properties like database size and the number of records. The scheme uses multiple sets of adversary knowledge and items in a category of adversary knowledge are replaced by other items in the category. Several experiments with real dataset show that our method can preserved at a utility with minimum lost and maintain data property as the same as original database.And propose an approach called sibling replacement to generate anonymized database which protects set-valued database from identity linkage attack with maintaining data utility and dataproperty.The proposed approach is totally different from generalization and suppression and adopts distortion based technique where value replacement is employed. In addition, it consists of two important steps, the first is grouping the records based on adversary knowledge and the second is selecting surrogateitemto replaceitemsinadversaryknowledge.

Xinyuxiong, et.al,…[3] propose an efficient, differential private frequent item sets mining algorithm over large-scale data. Based on the ideas of sampling and transaction truncation using length constraints, our algorithm reduces the computation intensity, reduces mining sensitivity, and thus improves data utility given a fixed privacy budget. We build our algorithm on FP-Tree for frequent itemsets mining. In order to solve the problem of building FP-Tree with large-scale data, we first use the sampling idea to obtain representative data to mine potential closed frequent itemsets, which are later used to find the final frequent items in the large-scale data. In addition, we employ the length constraint strategy to solve the problem of high global sensitivity. Specifically, we use string matching ideas to discover the most similar string in the source dataset, and implement transaction truncation for achieving the lowest information loss. We finally add the Laplace noise for frequent itemsets to ensure privacy guarantees.

Jinyanwang, et.al,…[4] analyze the privacy problem in publishing transactional data streams based on a sliding window. Then, we present two dynamic algorithms with generalization and suppression to anonymize continuously a sliding window to make it satisfy   -uncertainty by structuring an affected sensitive rules trie, because the removal and addition of transactions may make the current sliding window fail to satisfy   -uncertainty. Experimental results show that our methods are more efficient than sliding window anonymization with batch processing by using existing static anonymization methods. Due to the wide application of sliding windows for data analysis, we consider the privacy problem in processing data stream based on a sliding window. We assume that the recipients of a published data stream are untrustworthy and include the researcher for data mining and other attackers. If an attacker has partial knowledge about a subset of items corresponding to a victim, he/she may attempt to infer sensitive information about the victim. By structuring an affected sensitive rules trie ASRT, we first present a dynamic algorithm with only suppression to continuously anonymize a sliding window to make it satisfy   -uncertainty. Then, to decrease the information loss, we present a dynamic anonymization algorithm by combining generalization and suppression.

Huaqun Wang,[5] analyzed the system with public cloud computing, the clients store their massive data in the remote public cloud servers. Since the stored data is outside of the control of the clients, it entails the security risks in terms of confidentiality, integrity and availability of data and service. Remote data integrity checking is a primitive which can be used to convince the cloud clients that their data are kept intact. In some special cases, the data owner may be restricted to access the public cloud server, the data owner will delegate the task of data processing and uploading to the third party, for example the proxy. On the other side, the remote data integrity checking protocol must be efficient in order to make it suitable for capacity-limited end devices. Thus, based on identity-based public cryptography and proxy public key cryptography, we will study ID-PUIC protocol. In public cloud environment, most clients upload their data to PCS and check their remote data's integrity by Internet. When the client is an individual manager, some practical problems will happen. If the manager is suspected of being involved into the commercial fraud, he will be taken away by the police. During

the period of investigation, the manager will be restricted to access the network in order to guard against collusion. But, the manager's legal business will go on during the period of investigation. If these data cannot be processed just in time, the manager will face the lose of economic interest.

Kaitai Liang, et.al,..[6] makes cloud storage service share a great piece of market cut in the field of data management even in the ear of big data. Remotely data storage delivers convenience to Internet users and meanwhile, brings security concerns. The fact that users cannot have full physical possession of their data immediately rises up two serious practical questions: how to guarantee the confidentiality of the data, and how to retrieve the data. For the first question, we usually tackle it by leveraging existing encryption cryptographic mechanisms, such that all outsourced data are encrypted and unaccessible to cloud servers. The encryption technology, with no doubt, enables us to protect the confidentiality of the data. However, it limits the flexibility of data retrieve to some extent. The premise of encryption technique is to prevent a cipher text holder from gaining access to the underlying knowledge of data. Without any knowledge related to the data, it looks impossible for a cloud server to fulfill any data retrieval task. A naive solution here for data retrieval is to allow the server to fully access the data, allocate the data and next return it to user. Nevertheless, this disgraces the meaning of encryption. To support data retrieval without loss of confidentiality, Searchable Encryption (SE) mechanisms have been proposed in the literature.

III. EXISTING METHODOLOGIES

A credit network models trust between agents in a distributed environment and enables payments between arbitrary pairs of agents. With their flexible design and robustness against intrusion, credit networks form the basis of several Sybil-tolerant social networks, spam-resistant communication protocols, and payment systems. Existing systems, however, expose agents' trust links as well as the existence and volumes of payment transactions, which is considered sensitive information in social environments or in the financial world. This raises a challenging privacy concern, which has largely been ignored by the research on credit networks so far. Privacy preserving standards have been created recently because sensitive information is now frequently stored on computers that are attached to the Internet. Also many tasks that were once done by hand are carried out by computer; therefore there is a need for Information Assurance (IA) and security. Privacy preserving is an important in order to guard against identity theft. Businesses also need security because they need to protect their trade secrets and proprietary information. Cyber-terrorism is one of the major terrorist threats posed to our nation today. As we have mentioned earlier, this threat is exacerbated by the vast quantities of information now available electronically and on the web. Homomorphic encryption is a form of encryption which allows specific types of computations to be carried out on cipher text and obtain an encrypted result which decrypted matches the result of operations performed on the plaintext. For instance, one person could add two encrypted numbers and then another person could decrypt the result, without either of them being able to find the value of the individual numbers.

3.1 HOMORPHIC ENCRYPTION:

Homomorphic encryption is a form of encryption that allows computation on cipher texts, generating an encrypted result which, when decrypted, matches the result of the operations as if they had been performed on the plaintext. The purpose of homomorphic encryption is to allow computation on encrypted data. Cloud computing platforms can perform difficult computations on homomorphically encrypted data without ever having access to the unencrypted data. Homomorphic encryption can also be used to securely chain together different services without exposing sensitive data. Homomorphic encryption can also be used to create other secure systems such as secure voting systems, collision-resistant hash functions, and private information retrieval schemes. Homomorphic encryption schemes are inherently malleable. In terms of malleability, homomorphic encryption schemes have weaker security properties than nonhomomorphic schemes. A cryptosystem that supports arbitrary computation on ciphertexts is known as fully homomorphic encryption (FHE) and is far more powerful. Such a scheme enables the construction of programs for any desirable functionality, which can be run on encrypted inputs to produce an encryption of the result. Since such a program need never decrypt its inputs, it can be run by an untrusted party without revealing its inputs and internal state. Fully

homomorphic cryptosystems have great practical implications in the outsourcing of private computations, for instance, in the context of cloud computing.

3.2 HORIZONTAL CLUSTERING:

Horizontal partitioning splits the entire database into several numbers of smaller databases based on the splitting of row. This is done in a way that the executing the query would become quick and also it will have the power to offer more amount of privacy to the partitioned database. Horizontally partitioned data could be exploited in which each fragment consists of a subset of records of R in the form of an association. Horizontal partitioning technique divides a table into different tables. Here, tables are divided in a way similar to the way query references are carried out by using lesser number of tables or large amount of UNION queries are employed to integrate the tables obviously during the moment of query that might, in turn, have an impact over the performance. For instance, assuming that in a project involving data mining it is required to explore the impacts of a drug over those patients who have special kind of illness. Particularly, for the purpose of getting different samples, there is a necessity to get the same data regarding this problem from various medical centers. In these kinds of situations, it is stated that the data is horizontally partitioned. The flow of horizontal clustering is shown in fig 2.
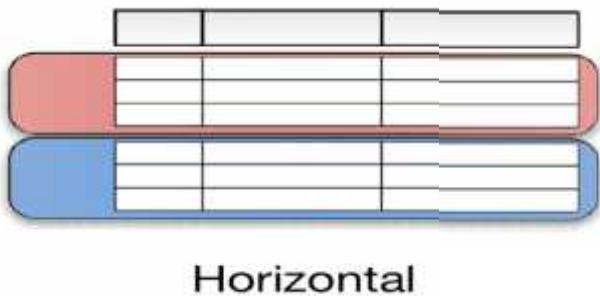
Fig 2: Horizontal Clustering

IV.   PROPOSED METHODOLOGIES

With the advent of communications techniques, e-commerce as well as online payment transactions are increasing day by day. Along with this financial frauds associated with these transactions are also intensifying which result in loss of billions of dollars every year globally. Also the various types of benefits like cash back, reward points, interest-free credit, discount offers on purchases made at selected stores, and so forth tempt the customers to use credit card instead of cash for their purchases. The major problem for e-commerce business today is that fraudulent transactions appear more and more like legitimate ones and simple pattern matching techniques are not efficient to detect fraud. We can implement vertical clustering algorithm to cluster the datasets into more than one level. Subsets of attributes (that is, columns) form the fragments. Rows of the fragments that correspond to each other have to be linked by a tuple identifier. A vertical fragmentation corresponds to projection operations on the table. Data from the fragments can be recombined to result in the original data set. For vertical fragmentation, the join operator is used on the tuple identifier to link the columns from the fragments; in horizontal fragmentation, the union operator is used on the rows coming from the fragments. And also implement K-Anonymity algorithm which is a property possessed by certain anonymized data. Given person-specific field-structured data, produce a release of the data with scientific guarantees that the individuals who are the subjects of the data cannot be re-identified while the data remain practically useful. A release of data is said to have the k-anonymity property if the information for each person contained in the release cannot be distinguished from at least k-1 individuals whose information also appear in the release. The various procedures and programs for generating anonymised data providing k-anonymity protection have been patented.

4.1 VERTICAL CLUSTERING:

Vertical portioning is a method that partitions the entire dataset into several number of small databases based on the column, such that the partitioned database does not have any duplicate

information. There are primarily two kinds of vertical database namely normalized and row splitting. The data might be split into a set that consists of small files, which are physical, and every individual file comprises of the subset of the actual association, where the association stands for the database transaction that actually requires the subsets of the attributes given. Here, in the case of vertical partitioning, the data concerned with a set of similar entities are located in diverse places, for instance consider that in a data mining procedure it is required to gather various kind of data like financial, medical, insurance and housing data about a variety of individuals living in a city. In this procedure, a diverse amount of data regarding a set of similar entities has to be gathered, i.e. those individuals resident in that city, from the servers of various organizations like medical institutions, government servers, municipalities, banks and so on.
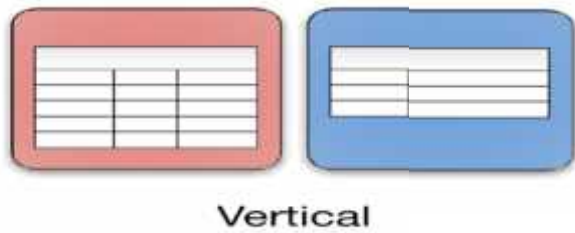
Fig 3: Vertical Clustering

4.2 K- ANONYMITY ALGORITHM:

Anonymization indicates the identification of the information, which is eliminated from the actual data to preserve individual or private data. There exists several means of performing data anonymization. Essentially, this technique employs k-anonymization approach. In case, every row in the table cannot be differentiated from at least other k-1 rows by just searching through a set of attributes, and so this table is called to be K-anonymized on these attributes. Privacy preservation has become a major issue in many data mining applications. When a data set is released to other parties for data mining, some privacy-preserving technique is often required to reduce the possibility of identifying sensitive information about individual. Privacy preservation is an important issue in the release of data for mining purposes. The k-anonymity model has been introduced for protecting individual identification. Recent studies show that a more sophisticated model is necessary to protect the association of individuals to sensitive information. Intuitively, privacy is measured by the information gain of an observer. Before seeing the released table, the observer has some prior belief about the sensitive attribute value of an individual. After seeing the released table, the observer has a posterior belief. Information gain can be represented as the difference between the posterior belief and the prior belief. The novelty of our approach is that we separate the information gain into two parts: that about the whole population in the released data and that about specific individuals. We now give key background on k-anonymity, including definitions, a single-site algorithm, and a relevant theorem. The following notations are crucial for understanding the algorithm:

Quasi-identifier (QI): a set of attributes that can be used with certain external information to identify a specific individual.

T,T[QI]: T is the original dataset represented in a relational form, T[QI] is the projection of T to the set of attributes contained in QI.

Tk[QI]: k-anonymous data generated from T with respect to the attributes in the Quasi-identifier QI.

Tk[QI] satisfies k-anonymity if and only if each record in it appears at least k times. The proposed framework is shown in fig 4.
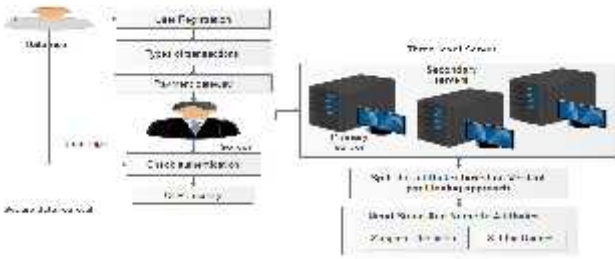
Fig 4: Proposed work

V. EXPERIMENTAL RESULTS

The proposed work is implemented in ASP.NET with code behind C# as front end and SQL SERVER as back end. The proposed results are shown in following figures.

Fig 5: User interface creation

   The basic user details are entered and stored in admin database. All user details are entered and viewed in back end and front end page. These details are vertically partitioned in secure manner.

Fig 6: Suppression of data

   This figure shows the details about suppression using K-Anonymity algorithm. Integer can be converted as range values and string values can be converted as special characters.
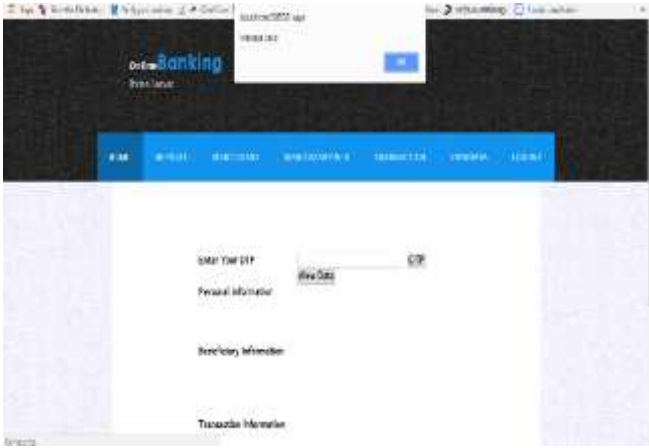
Fig 7: Authorized Access

This screen display the authorized access based on OTP security. After entering OTP, original details are extracted in page. Evaluate the performance of the system in term of anonymization time and also memory consumption.

Memory Consumption = (Original data size – Anonymized data set size)
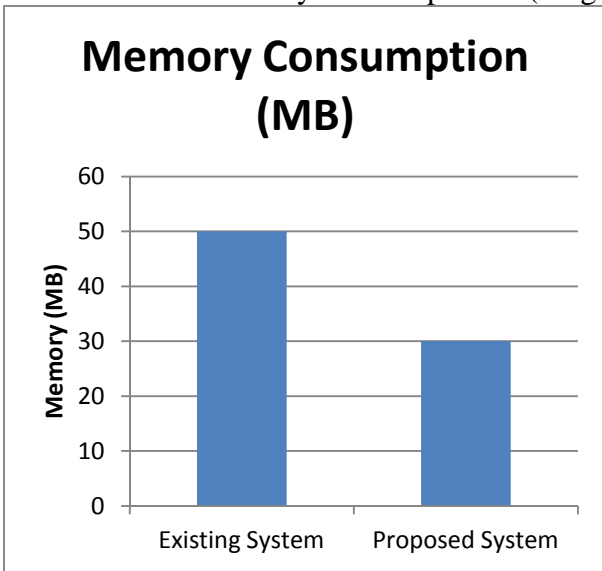
Fig 8: Memory Consumption

From the above graph, proposed system preserves the memory less than the existing encryption schemes. And also time can be reduced at the time of converting data into anonymized data and illustrated in fig.
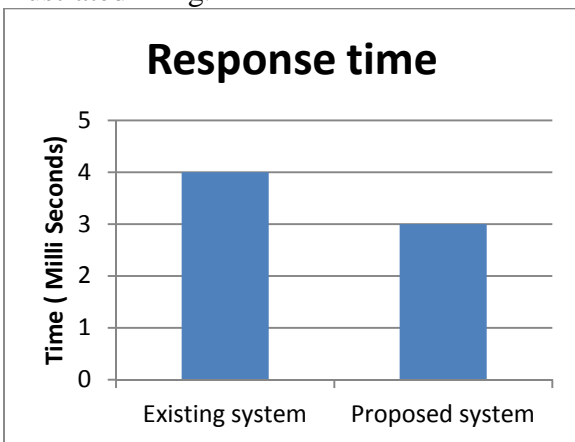
Fig 9: Response time

The proposed system can be provide reduce number of response time and also reduce the memory data

VI. CONCLUSION

The primary goal of data privacy is the protection of personally identifiable information. In general, information is considered personally identifiable if it can be linked, directly or indirectly, to an individual person. Thus, when personal data are subjected to mining, the attribute values associated with individuals are private and must be protected from disclosure. Miners are then able to learn from global models rather than from the characteristics of a particular individual. In this project we can conclude that the proposed system provide improved security in cloud data. We can implement vertical partitioning approach and K-Anonymity approach. K-Anonymity is a privacy preserving method for limiting disclosure of private information in data mining. The process of anonymizing a database table typically involves generalizing table entries and, consequently, it incurs loss of relevant information. This motivates the search for anonymization algorithms that achieve the required level of anonymization while incurring a minimal loss of information. The problem of k-anonymization with minimal loss of information is NP-hard. A variety of data modification techniques such as randomization and K-anonymity based techniques has been studied and analyzed based on their activities.

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Preventing From E-Phishing Network Using Svm Classifiers

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Abstract: Website phishing is considered one of the crucial security challenges for the online community due to the massive numbers of online transactions performed on a daily basis .Website phishing can be described as mimicking a trusted website to obtain sensitive information from online users such as usernames and passwords. Black lists, white lists and the utilisation of search methods are examples of solutions to minimise the risk of this problem. One intelligent approach based on SVM Classification Technique .Its seems a potential solution that may effectively detect phishing websites with high accuracy. According to experimental studies, its often extracts classifiers containing simple "If-Then" rules with a high degree of predictive accuracy. In this project , we investigate the problem of website phishing using a developed SVM method called to seek its applicability to the phishing problem. We also want to identify features that distinguish phishing websites from legitimate ones. In addition, we survey intelligent approaches used to handle the phishing problem. Experimental results using real data collected from different sources show that particularly detects phishing websites with higher accuracy than other intelligent algorithms.

Index Terms: Phishing websites, SVM classifiers, URL processing, duster framework, website phishing detection.

I. INTRODUCTION

A. Phishing Websites:

Phishing is a criminal activity that steals victims' personal information using misleading emails or fake websites [1]. The word "phishing" is originated from the word "fishing" [2]. Online users can be easily deceived into entering their personal information because phishing websites are highly similar to real ones. Maliciously, by creating phishing sites, "phishers" use a number of techniques to fool their victims, including email messages, instant messages, forum posts, phone calls, and social networking information [3]. Phishing results in severe economic loss all over the world, and phishing sites are also growing rapidly in quantity and complexity. According to reports from the Anti-Phishing Working Group [3], the number of phishing attacks is increasing by 5% monthly.

Fig. 1 according to the APWG's(unique phishing sites detection working graph) new activities trends reports of 2017 [4].

First, mobile users check their emails and use Web browsers more frequently than desktop users [5]. Thus, they are much more likely to access on phishing sites that have not yet been detected or taken down by anti-phishing applications and firewalls at their local networks or on their devices. Second, mobile devices are always "hungry" for energy and computing resources (e.g., limitations of CPU, memory, and user interfaces), so anti-phishing tools are usually ignored or removed on these devices. Hence, it is hard for users to discern if an incoming link is legitimate or not. Third, existing antiphishing tools (e.g., default plug-ins on Web browsers or local anti-phishing applications) are inefficient in terms of detection (this will be analyzed concretely later in Section III), and mobile users may be exposed to phishing attacks when engaging in usual behaviors. According to the report [6], mobile users are three times more likely to submit their login information than desktop users do. Therefore, preventing phishing attacks against terminal users is a critical issue in the edge of networks. As discussed in [7], there are three classes of technical methods to identify phishing websites, including the blacklist/whitelist methods [7], [8], the Web structure-based methods[7].The blacklist methods are often deployed in practice due to their inexpensive cost and speed of detection [10].On the other hand ,although web content based methods can detect phishing websites with high accuracy [7],they difficult to apply in real time detection.The network operators can combine content-based methods and blacklist/whitelist methods by regularly creating a large amount of automated agents to collect webpages or receive phishing reports from users, then analyze the content and update the blacklist/whitelist database [11]. In this paper we using svm clasifiers that uses url prrocessing, duster framework, training set and testing set.

II. RELATED WORK

Many authors have proposed various techniques to remove the Duplicate URL from the webthat is inspecting the URL without fetching their content.
Bar-Yossefet. et al.[2] proposed a algorithm called DUSTBUSTER which is used to detect DUST rules. This algorithm helps to detect DUST by finding the normalization rules that transform a given URL likely to have similar content. This technique was done using substring substitution method.For example if the last part of URL is "story_1259" it should be converted into valid rule as"story?id=1259" and "news.google.com" valid rules as"google.com/news"Dust Buster mines dust effectively from previous crawl logs or web server logs, without examining the page details. But these substitution rules derived from algorithm were not able to capture many duplicate URL on the web. In 2008 A. Dasguptaet.et al.[3] proposed a new method which

was able to capture all previous substitution rules. In this method URL are divided into equivalence class.URL with same equivalence class have same content. These rewrite rules can then be applied to eliminate duplicates among URLs that are encountered for the first time during crawling, even without fetching their content .It helps for trapping duplicates much earlier in a search-engine workflow, which improve the efficiency of entire processing. The disadvantage of this method is that it was unable to capture many common duplicate URL.H.S. Koppulaet.et al. in 2010 proposed [4] a technique to mine rules from URLs and utilize these rules for de-duplication using just URL strings without fetching the content explicitly. The technique is made of extracting the crawl logs and using clusters of related pages to mine detailed rules from URLs which belongs to each cluster. It presents deep and basic tokenization of URLs to mine all possible tokens from URLs which are extracted by rule generation techniques for generating normalization rules. Problem with this method was not publicly available and it was not described with enough detail because it uses a bottom up approach in which the normalization rules are learned by inducing local duplicate pairs to more general form. In 2010 Lie et. al[5] rethought the problem of URL normalization from a global perspective and proposed a top down URL pattern tree (UPT) based approach, which is remarkably different from existing approaches.(UPT) is built from clusters of duplicate URLs for a targeted website. The pattern tree helps to leverage the statistical information from all the training samples to create the learning process further strong and reliable.Figure1 shows pair wise bottom up approach there are four different URL. The values of the token T3 and T5 are generalized to „*". Unfortunately this approach does not work up to the mark as the pattern tree construction algorithm should be accelerated further as it contributes to bottleneck.

	T_1	T_2	T_3	T_4	T_5
U5	a	B	y	c	P
U6	a	B	y	c	Q
U7	a	B	z	c	M
U8	a	B	z	c	n
			↓		↓
R1	a	B	*	c	*

Figure 1. Pairwise Bottom-up Strategy [5]

Sérgio Anibal de Carvalhoet.et al.in 2005 proposed [13] a method called sequence alignment in 2005.This method gives detail description of how sequence alignment is done. Here sequences are compared to identify similarities and differences between them. Sequence alignment means the relation between two strings. The characters in substring may be continuous while in subsequence may be non-continuous. For example "abc" is a subsequence but not a string of „axbxcx".In general distance between the two sequence is amount of work done to convert one sequence into another. The idea of aligning two sequences of possibly different size is to write one on top of the other, and break them into smaller pieces by inserting spaces in one or the other so that identical subsequences are eventually aligned in a one-to-one correspondence. For sequence alignment consider an example of two sequences A and B respectively, A=ACAAGACAGCGT and B=AGAACAAGGCGT. Alignment of both sequences is done as below:

$$A = ACAAGACAG\text{-}CGT$$
$$|\ \ ||\ \ \ \ |\ |\ |\ \ ||$$
$$B = AGAACA\text{-}AGGCGT$$

The main objective is to match the subsequence as far as possible. In the above example there are nine matches shown by vertical bar. However, if the sequences are not identical, mismatches are likely to occur as different letters are aligned together. Sequence alignment is a way of transforming one sequence into another.

III. SYSTEM ARCHITECTURE

Figure 2 shows the system architecture of the proposed system. In this system user has to provide a file which is obtained from crawl log or web server log. The file contains a set of URL swhich are requested by the client. These URL are then processed and identified by the system whether they are duplicate or not. Duplicate URLs with similar text are grouped into cluster. These clusters of URLs are then processed by using URL processing technique which is discussed as below.
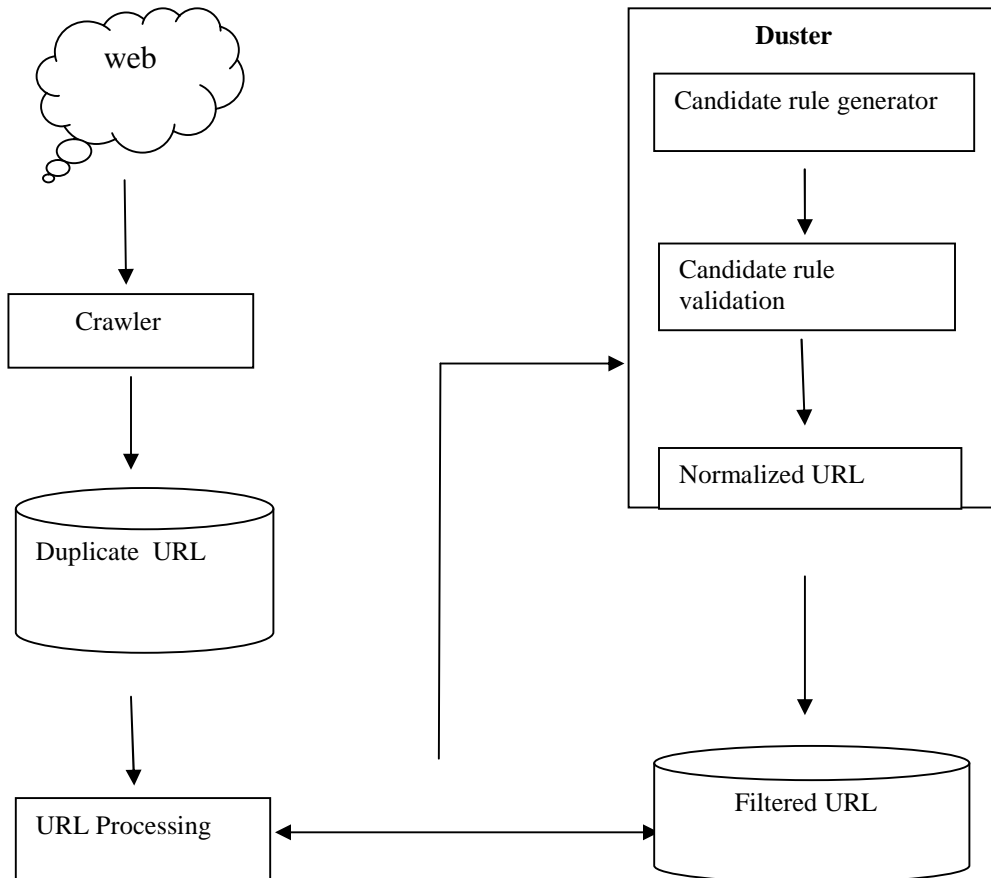
URL Processing

The main aim of this phase is to generate the consensus sequence from the Dup-cluster of URL. The detail description of URL processing is given in Figure 3.

```
┌─────────────────────┐
│   URL Processing     │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Tokenization       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│  Pair Wise Alignment │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Multiple URL Alignment│
└─────────────────────┘
```
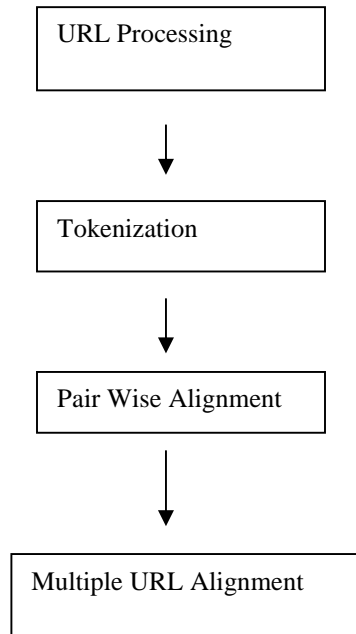
Figure 3. URL Processing

The first step of URL processing is Tokenization. Each URL to be aligned is initially parsed according to grammar G. This process, referred to as tokenization, which decomposes the URL into a sequence of singleton set called as URL tokens. For example, URL u=http://example.com/1.htms Then token set of URL is as below
S={http},{:},{/},{/},{example},{.},{com},{/},{htms}After the tokenization URL are aligned using pairwise URL alignment method. In pairwise URL alignment two URLs are taken in which mapping of two URL with another similar pair of URL with same characters, in same order with possible inserted spaces is done [11].Alignment process can be described by using a matrix S of size (m+1)*(n+1) so that S cells are filled as follows [10].

$$
S_{i,j} = \max \begin{cases} \mathbf{0} \\ S_{i-1,j-1}+Sf(x_i,y_j) \quad \text{if i=0 or j} \geq 0 \text{ otherwise} \\ S_{i-1,\,j,} \\ S_{i,\,j-1} \end{cases}
$$

Where is a scoring function that describes the similarity between pair of URL. This function gives points for matching and penalties for gap. The basic idea of scoring function is as follows (1) if the token set contains at least one token in common than the score is higher. (2)if token set contains token in common but at different position ,than score is high but smaller than in first case.(3)if token set has no token in common but token of same type than the score is small than in case 1.(4)score value indicate penalty in other case. Larger score value indicate better alignment. After pairwise URL alignment Multiple URL alignment is done which is a progressive alignment process. Multiple URL Alignment process continues until it gives rise to a final consensus sequence. A consensus sequence is created by aligning the URLs in each cluster by using Multiple URL alignment algorithm which is discussed in section

IV. SUPPORT VECTOR MACHINE

The SVM algorithm is applied to categories the phishing and malware site.SVM is machine learning algorithm[12][13][14]. SVMs classify data by determining a set of support vectors, which are members of the feature space.SVM contains three functions linear, polynomial and sigmoid.user can select any one of the function to classify the data we will be dealing with Linear/RBF(Radial basic function)or Sigmoid kernel method.
SVM Algorithm
Input: Train Data Set-Train, Test Data Set-Test
Output: Web site Categorization Result Normal, phishing or Malware
      1.Read Train Data Set
      2.Apply SVM algorithm
      3.Generate SVM Model for Kernel function
      4.Read Test Data Set
      5.For each URL in Test Data
      6.Extract all the features
      7.Apply SVM algorithm
      8.Return Result of Test Data
      9.End

Mathematical Model for proposed System:

Input: Train Data Set_ Train, Train Data Set_Test
Process: The following parameter is needed to generate the SVM model:
      N:Total number of features
      K:Kernal function
      X:Feature Vector
Kernel is defined as a function that accepts two vectors x and x as inputs and produces an output which is defined
as the inner product of their images   (x) and   (x) (x1, x2) =   (x1)   (x2)
Output: Web site Categorization Result Normal,Phishing or Malware.

V.IDENTIFYING PHISHING SITES AND THE SISTEM MODEL

To easily understand how to identify phishing sites, in this section, we briefly discuss some background knowledge related to phishing identification and illustrate our proposed anti-phishing model using SVM[15][16].

A.URL Tokenization :

In this module is used to URL to be aligned is initially parsed according to grammar. This process, referred to as tokenization, decomposes the URL into a sequence of URL tokens. To facilitate URL alignment, each token extracted from a URL is represented as a singleton set.

B.Multiple Alignment Sequence:

It is a tool to identify similarities and differences among strings/sequences. These similarities and differences can be explored to determine fixed and mutable substrings in URLs, which helps to derive normalization rules. As multiple sequence alignment methods find patterns involving all the available strings, the method is able to find more general rules and avoids problems related to pair wise rule generation, and the problem related to finding rules across sites. Thus, a full multi-sequence alignment of duplicate URLs, which is performed before rules are generated, can make the learning process more robust and less susceptible to noise.

C.DUSTER:

A new method called as DUSTER, which obtains a smaller and more general set of normalization rules using multiple sequence alignment. The proposed method is able to generate rules with an acceptable computational cost even when crawling in large scale scenarios. Also its complexity is proportional to the number of URLs to be aligned. The DUSTER method is divided in two main phases as mentioned below,

Phase 1: Candidate rules generation:

In this phase first, the multi-sequence alignment algorithm, align all the URLs in the dup-clusters and obtains consensus sequences for each dup-cluster. Then the candidate rules are generated from these sequences. For large clusters, a heuristic is used to ensure the efficiency of the method.

 Phase 2: Validating candidate rules:

In this phase the candidate rules get filtered out according to their performance in a validationset.

D.Phishing website Detection :

In this module can be used, the URL normalization is the process by which URLs are modified and standardized in a consistent manner. The goal of the normalization process is to transform a URL into a normalized URL so it is possible to determine if two syntactically different URLs may be equivalent. Search engines employ URL normalization in order to help website pages to get found on search engines easily on the related search terms and to reduce indexing of

duplicate pages. Web crawlers perform URL normalization in order to avoid crawling the same resource more than once. Web browsers may perform normalization to determine if a link has been visited or to determine if a page has been cached.

E.Identification features:

Phishers usually try to make the Internet addresses (URLs) of phishing sites similar to legitimate sites to fool online users[17][18][19]. However, they cannot reuse URLs of legitimate sites that are already registered. Based on various characteristics of URLs, we indicate the differences between a legitimate URL and a phishing URL.

Features of URL. The structure of URL is as fol- lows: < protocol >: // < SubDomain > . < PrimaryDomain > . < T LD > / < PathDomain >. For example, the URL: http://paypal.abc.net/ index.htm includes the following six elements: the protocol is http, the Sub Domain is paypal, the Primary Domain is abc, the top-level domain (TLD) is net, the Domain is abc.net, and the Path Domain is index. htm . There exist many differences between phishing URLs and legitimate URLs that can be used to recognize easily based on URL features. In particular, we describe indetail three features: the Primary Domain, Sub Domain and PathDomain of the URL.–Primary Domain: Phishers cannot use the origi-nal Primary Domain since it is already registered by the original company. Hence, phishers registermiss pellings or similar PrimaryDomain of phish-ing websites to fool users. For example, URL www.paypall.com looks similar to the well-known website www.paypal.com. Personal use is permitted, but republication/redistribution requires.http://www.ieee.org/publications_standards/publications/rights/index.html for more information. This article has been accepted for publication in a future issue of this journal, but has not been fully edited. Content may change prior to final publication. Citation information: DOI 10.1109/TNSM.2018.2831197, IEEE Transactions on Network and Service Management–SubDomain: Phishers often prepend the domain of phishing websites to their website. For example, phishers prepend the SubDomain "paypal.com" to any other domain (e.g., ".io", ".biz") that may fool users into the phishing URLs. – PathDomain: This is a sub-folder of the URL. Phish- ers can also use the PathDomain to fool users. For example, phishers may navigate users to the URL www.attack.com/paypal, where a phishing website interface is similar to the original one. Carelessly, the users will think that this URL is from the "paypal.com" site. Especially, using mobile devices with small graphic interfaces, it may be too difficult to recognize such phishing URLs[20].

VI. EXPERIMENTAL RESULTS

Experimental results have the results of the proposed work . proposed work was implemented using PHYTHON is a font end and MYSQL is a back end process below mentioned screenshots show the process of duplication checking . The dataset is collectected and using the svmm classification features we obtain result.

A.Phishing url:

The experimental results show the detection solution achieves 99.0% accuracy on average that the phishing URLs achieve is downloaded in PhishTank.
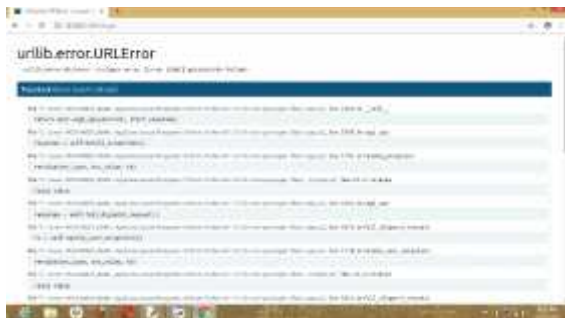
B.Phishing website:

 In this work, we will explore the drawbacks of the existed methods, will study and extract the main features that are necessary to detect website as phishy or legitimate as feature extraction its preprocessing and selection is an important part in detection of phishing website and will propose a method based on these extracted features for blocking phishing websites.
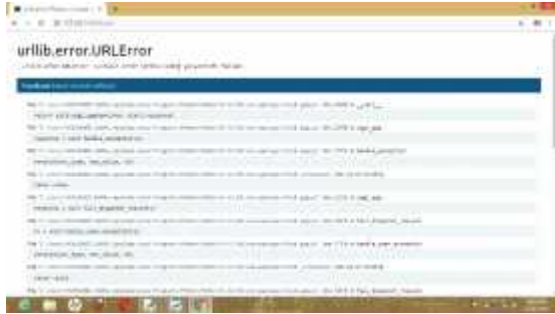
C.Keyword classification:

we have applied classification algorithm to classify opinion as either positive or negative. Support vector machine algorithm is used to classify reviews where RBF kernel SVM is modified by its hyper parameters which are soft margin constant C , Gamma **.**

VII. CONCLUSIONS

To implement a DUSTER, a new method to address the DUST problem, that is, the detection of Phishing URLs that correspond to pages with duplicate or near-duplicate content. DUSTER learns normalization rules that are very precise in converting distinct URLs which refer the same content to a common canonical form, making it easy to detect them. To achieve this, DUSTER applies a novel strategy based on a full multi sequence alignment of training URLs with duplicate content.

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Virtualization in Industries

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Abstract— In, early days industries used physical role-based servers but as they were hard to scale according to the load they are getting and it was hard to manage the infrastructure and if any server is failed then the service correspond to that server also gets down and a plausible solution to all these problems were solved by Virtualization.

I.INTRODUCTION

Today many people know that the most efficient way of getting max performance from an infrastructure is by Virtualization as it provides efficiency and redundancy at many levels but only a few knows that why all major organizations moved to Virtualization from using physical servers in their datacenters and why is it more efficient, convenient and better choice to run all servers on virtualized computing fabric rather than deploying everything on physical servers.

II.ABOUT VIRTUALIZATION

Virtualization is a technology in which an application, guest os or data storage is kept away from the true underlying hardware or software. A key use of virtualization technology is server virtualization, which uses a software layer called a hypervisor to emulate the underlying hardware. This often includes the CPU's memory, I/O and network traffic. The guest operating system, normally interacting with true hardware, is now doing so with a software emulation of that hardware, and often the guest operating system has no idea it's on virtualized hardware. While the performance of this virtual system is not equal to the performance of the operating system running on true hardware, the concept of virtualization works because most guest operating systems and applications don't need the full use of the underlying hardware. This allows for greater flexibility, control and isolation by removing the dependency on a given hardware platform. While initially meant for server virtualization, the concept of virtualization has spread to applications, networks, data and desktops.[8]

2.1 History Of Virtualization

As many say that Virtualization started from 1972 by IBM in its mainframe on VM/370 as an advanced function and a Type-I code but the truth is that is goes at-least 8

years before that and the idea of virtualization came in a research by IBM Cambridge scientific center in 1964 as System/360 Model 40 then in 1967 all this aligned with IBM system/360 Model 67 with also start of new technology DAT (Dynamic Address translation) which basically acted as the base technology for Virtualization of memory. Later by 1968 when IBM started to provide all this technology as CP/CMS as type-III code without any service or support. Now then IBM announced its IBM System/370 in 1970 Virtualization was not part of it and

later in 1972 when IBM announced Advance function for its System/370 and it was called VM/370 but at this time all Virtualization was only focused on mainframe systems to make them more secure and to make then more efficient. [7]

2.2 The Rise Of Virtualization in Commercial marketplace

At this time the Virtualization was limited to mainframe computing field but as the time continues researchers realized that virtualization can be a great boon for the field of datacenters, servers and normal computing environment as typically these systems are being under or over used at a given piece of time. By 2001 the first major program for Virtualization or a hypervisor came in market by many different brands likely Connectix, VMware, Egenera Inc., and Virtutech with collaboration with AMD. At this point the race of bringing Virtualization came in place and by 2003 first open source hypervisor came which was names as Xen at this point Microsoft also came into market with Microsoft Virtual Pc, by the real use of Virtualization started by 2006. Now these companies started to make solutions for enterprise server Virtualization environment and it was first done by product name Virtual Iron from Virtual Iron software later which have been bought by oracle. At this point people started to realize why is was better to use Virtualization by 2009.

III.LITERATURE SURVEY

In his paper, Richard Scroggins (2013) describes that trends in virtualization are always changing. As the technology matures and advances are made, there are more options open to administrators and more cost saving virtualization projects that can be implemented. The website "Virtualize Your IT Infrastructure" by the VMWare Company gives you some idea of the capability using the VMWare product, which is simply one of several virtualization options. When compared with other hypervisors like Hyper V, or KVM, the features of VMWare's ESX and Esxi stand out. (Virtualize Your IT Infrastructure, 2012). [5]

Connor (2004) makes the point that server virtualization is moving from small markets to the mainstream and that the rate of implementation is steadily increasing. Spiegel (2006) makes the case that there are business benefits in application and server virtualization, "Application virtualization is the new fancy trendy name for server-based computing. However, instead of installing applications on desktops, the applications are installed in a server farm for secure, remote access. Server virtualization allows you to take multiple

physical servers and create the same number of virtual servers, or "machines," on one host physical server". [7]

Hassell (2007) gives us a summary of his article in the abstract section when he says, "Virtualization, the move from real, physical hardware to virtual hardware is being seen as one of the "next big things" in IT. It's becoming easier to imagine a world where the general-purpose operating system is replaced by a much thinner, purpose-specific framework that exists solely to operate a single application. I think that's where the future lies, but we shouldn't expect that kind of industry shift to take place overnight (Matt Prigge- InfoWorld). According to all of these people the shift to virtualization from physical infrastructure has been a major move in the industry. At present, virtualization is very popular and commonly used, as well as very significant. [5]

IV.WHY MAJOR INDUSTRIES WENT FOR VIRTUALIZED ENVIRONMENT

Virtualization helps to take back control of organization's infrastructure. Virtualization enables organization to see and manage organization's computing resources in ways that offer more flexibility because organization are not restricted by implementation, location, or physical packaging. With virtualization, organization have a logical rather than a physical view of data, computing power, storage capacity, and other resources. By gaining greater control of organization's infrastructure, organization can improve cost management. [7]

Cost savings is a primary driver for initial virtualization deployment. The full value of virtualization lies in its ability to:

- Reduce operating costs:
  o Consolidate via virtualization to fewer systems.
  o Simplify management of the infrastructure.
  o Recapture floor space through consolidation.

- Improve service responsiveness.
  o Improve system, network, and application performance.
  o Process more information in real-time to make better business decisions.
  o Bring new services online quickly.

- Manage availability in a 24/7 world.
  o Increase availability and improve resiliency.
  o Manage and secure data without affecting its availability.

- Dynamically adapt to the peaks of the business.
  o Dynamically deliver resources where needed most.
  o Make data available from anywhere, anytime.

By decreasing management costs and increasing asset utilization, organization can experience a rapid return on investment (ROI) with virtualization. In addition, by virtualizing resources and making them easier to migrate or fail over to other physical devices or locations, organization can enhance system availability and help lower the cost and complexity of disaster-recovery solutions. [7]
Companies of all sizes are aggressively adopting virtualization solutions to help with:

- Infrastructure simplification - Virtualization can help control infrastructure sprawl through the deployment of virtual servers and storage that run

securely across a shared hardware environment. Virtualization not only helps with server consolidation, but also server containment when deploying new systems. Consolidating to a virtual infrastructure can enable you to increase server utilization rates from 5% to 15% to over 70%, thus helping improve ROI. In addition, a simplified infrastructure can help lower management costs with a common management platform and tooling.

- Rapid application deployment - Virtualization can help enable rapid infrastructure provisioning (for example, minutes compared to days). It can help developers speed application test and Deployment, enhance collaboration, and improve access to the infrastructure. The ease and flexibility of creating and reconfiguring guest operating systems (OSs) means that development and test environments can realize significant benefits from virtualization. For example, you can use Dynamic Logical Partitions (LPARs) on Power in a shared development environment where applications can reside in logically separate operating system environments, but on shared hardware. Partitions can be expanded dynamically for load testing and contracted dynamically when testing is complete. Thus, you can maximize the investment in your environment and quickly make changes based on demands and business priorities.

- Business resiliency - Virtualization can help IT managers secure and isolate application workloads and data within virtual servers and storage devices for easier replication and restoration. This added resiliency can provide IT managers with greater flexibility to maintain a highly available infrastructure while performing planned maintenance, and to configure low-cost disaster-recovery solutions. Virtualization technologies solve many traditional backup issues because they decouple the bindings between the operating system (with the application and data) and the underlying hardware.

- Managing a virtualized infrastructure – There are many software from many different companies that offer the right systems management platform and common tools to support both virtual and physical devices. IT managers can address configuration, deployment, monitoring, workload management, and

  additional management functions in a consistent and common way across their infrastructures. This can help simplify problem determination, increase productivity, and lower management costs.

V.IMPLEMENTATION

5.1 Softwares and hardwares used
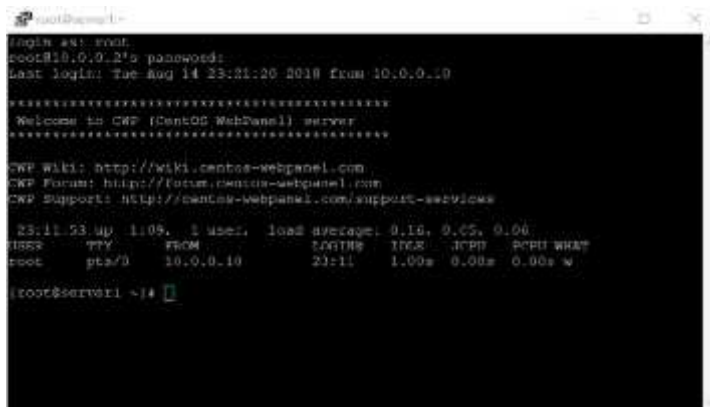
1) Physical server specifications:
   1) CPU - 2x Xeon E5450
   2) Ram - 48 GB DDR2 ECC 5300R
   3) MOBO - SuperMicro X7DCL-3
   4) HDD - 2X Seagate Constellation (Raid 1)
   5) OS - Centos 7 minimal
   6) Webserver - Apache
   7) Major Role - Webserver, MySql server (MariaDB)

2) CWP (CentOS Web Panel): Web hosting panel which is used for quick and easy management of   servers without the effort to use SSH console every time.

3) Putty: Open Source SSH and Telnet Client

4) DataDog: Software for modern monitoring and analytics.

5) Apache Webserver and MySQL Server

5.2 Process

Setting up the test environment started by installation CentOS 7 on the physical server and using an SSH client to access and configure it as a webserver. It is a common industry practice to use headless servers which are servers without a monitor. For metrics DataDog was used which is a monitoring software to generate the performance metrics .

Accessing the server:

Putty is a commonly used ssh client which is used to access the server for configuration the Server. [b]

Managing server using CWP:

CWP stands for centos web panel which provides a Gui based dashboard which helps to control the services that is being installed on the server. [b]

3 hours of workload:

This is a custom script to request http request from the server on different services its running. And we used to simulate the workload on the server.

24 Hours metrics of physical server on DataDog[3]:
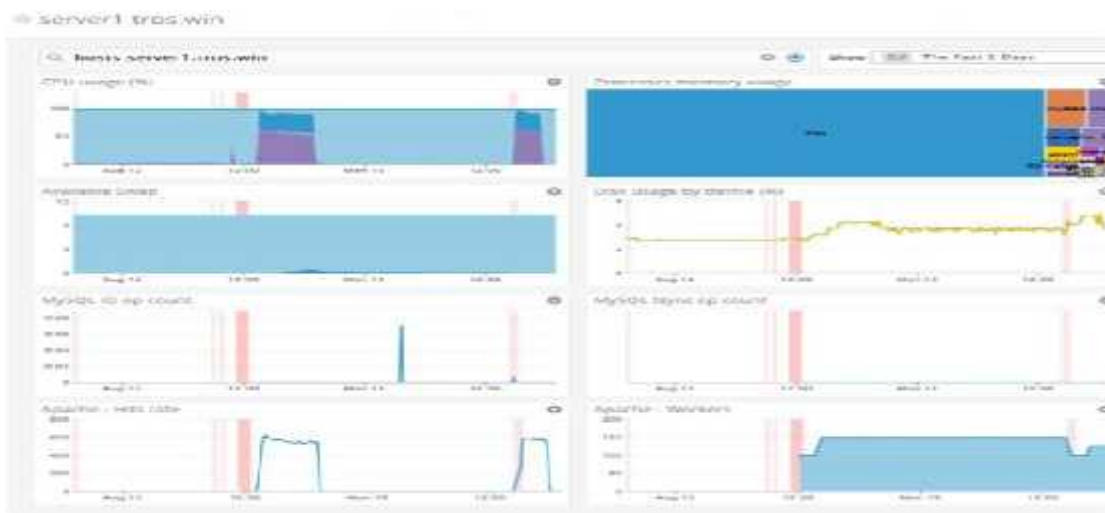
The analysis includes CPU utilization, Disk Usage, Disk Latency, Memory Breakdown and MySQL and Apache statistics. The load is at its peak from 4:00pm to 7:00pm. From the above images of DataDog Metrics we can conclude that this server this only being used for a certain role and this server is highly inefficient as its wasting power 24x7 and the workload is on its peak only for a few hours, which can be solved if we virtualizes the server on a pool and a custom rule can be also created to make the server configuration better when the server observe the peak of its workload and decrease it back again.

VI.CONCLUSION

In virtualizing the environment, we can keep this server at minimum

configuration and at the time when this server expects heavy workload the configuration of the server can be cranked up so the server performs maximum on the performance-watt ratio. The virtualized environment also provides advance features like load management on servers in real-time and it also enable the organization to make their environment more efficient and robust with more efficient backups and security.

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The Internet of Things in Oil-Gas Industry

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Abstract— In this paper proposes architecture based on the Internet of Things for monitoring various operations of the oil and gas industry. Use of several Wireless Sensor Networks in management of oil and gas platforms is researched. New opportunities created by processing of data collected via sensors for improvement of safety of oil platforms (deposits), optimization of operations, prevention of problems, troubleshooting and reduction of exploitation costs in oil and gas industry.
Keywords— Internet of Things, Wireless Sensor Networks, monitoring, sensors, smart objects, network gateways, control center.

I.INTRODUCTION

In the modern era, the oil and gas industry faces new production problems, especially against the background of a decline in oil prices. Finding new modernized ways to improve results and reduce costs in order to increase efficiency and competitiveness is an urgent and important task. Here a special role is assigned to collection of more detailed and accurate information about the production process and solution of the control problem. Directions such as increasing the speed of exploration and detection of oil, increasing oil production and reducing the risks to health, security of humans and the environment identified as a result of equipment malfunctions or operator errors are constantly developed with application of Internet of Things (IoT).

IoT is characterized as the next revolutionary development layer of information technologies fields after computer, Internet and mobile telephone communication. It is mainly used in medicine, agriculture, oil-gas industry and other fields in order to remotely control occurring changes, prevent fires and provision of other useful functionality.

Kevin Ashton, one of the developers of Radio Frequency Identification (RFID) technology notes that, IoT has a potential to change the world as much as Internet, may be even more [1].

Solution of several important social problems is expected with realization of IoT. Also, improvement issues of control development processes in oil and gas industry will be solved.

IoT will affect everything that surrounds us in nearest decades. Mentioned technology is mainly applied in following fields [2]:
- oil-gas industry: control of oil products exploration, production, processing,

transportation and sale processes;

- in cities: transport control, lighting, stops, smart office buildings, waste control;
- energy production and distribution: smart grid, microgrid, electrical stations control systems;
- agriculture: efficient production, situation based irrigation and fertilization;
- environment: pre-detection of forest fires, tracking animals that are becoming extinct;
- medicine: remote diagnostics, monitoring of old and sick individuals;

Oil-gas industry covers expedition, production, processing, transportation and sale processes of oil products. Fuel, oil and gasoline form the majority of products of this industry. Oil is also the raw material for many chemical products, including drug preparations, solutions, fertilizers, pesticides and plastic production. As demand for natural fuel is increasing daily, oil and gas companies must create new technologies and improve operations for increased productivity.

Application of IoT, which is based on sensors, can be taken as a topical issue as the way of implementing the right strategy in gathering information in the oil and gas sector. Application of this technology will enable to control efficiency, make efficient decisions, improve production and increase competitiveness. Oil-gas industry is the main industry controlling many other industries, important for worldwide energy production and significantly affecting world economy as a result [3].

Main results of IoT technologies for oil and gas industry are following:

- IoT has several significantly important potential applications in facility exploration, excavation and production operations, maintenance and overall facility control.
- works on application of IoT technologies in oil and gas field are on experimental level for now and performed works are focused on intensive processing of data and effective control of entrance/exit loadings.
- main objectives of IoT technologies' application are as following:
- detection of more hydrocarbon deposits;
- safe, efficient production and transportation with minimal ecological impact;
- planning of optimization;
- customer relations management;
- identification of new opportunities and markets.

II. APPLICATION OF INTERNET OF THINGS TECHNOLOGIES IN OIL-GAS INDUSTRY

As in all sectors of the industry, application of IoT in the oil and gas industry promises great economic hopes. The application of this technology ensures the solution of a number of scientific-theoretical and technological problems [2]:

- controlling used equipment (engine, pumps, drilling rigs, etc.);
- optimization of drilling axis replacement;
- automatic production platform control;
- early detection of leaks;
- pipeline monitoring (for the safety of mechanical- physical condition);
- tracking staff through geolocation and monitoring of certain security factors (for example, based on immobility for a certain period of time to notify if the staff member has been injured or fallen by determining the user's pulse through smart helmets or anklets);
- reducing the need for man-made inspections, detecting leaks in real time, as well as measuring various parameters at the entrance of the oil well to optimize parameters

through analytics and machine learning.

The technological process of the oil and gas industry can be conditionally divided into three major sectors [4]. The first sector covers exploration drilling and production processes. Here, primarily, potential underground or underwater crude oil, natural gas deposits and potential hydrocarbon reserves are researched and explored; exploration wells are drilled in the second stage and then hydrocarbon reserves are extracted from hydrocarbon reserves in oil or gas fields. These hydrocarbons allow the extraction of crude oil or crude natural gas to the surface. In the second sector, crude oil or oil products are transported.

Pipelines, rails, trucks, tanks and many other transportation systems are used to extract crude oil and extract hydrocarbons from production and wells to the processing areas where hydrocarbon and oil refining is performed. Later, various products are processed into the third sector. This sector covers crude oil processing and crude natural gas processing and purification. At this stage, petrol or fuel oil, kerosene, aircraft fuel, diesel fuel, heating supplies, oil, lubricants, wax, asphalt, natural gas and liquefied petroleum gas, as well as hundreds of petrochemical products are offered to consumers.

The article considers the application of IoT technologies to monitor the various operations of these sectors of oil and gas industry.

III. DEVELOPMENT OF THE ARCHITECTURE BASED ON INTERNET OF THINGS FOR MONITORING OF OIL-GAS INDUSTRY

This section presents the IoT based architecture for monitoring various operations of the upper, middle and sub- sectors of the oil and gas industry (Figure 1).

The proposed architecture consists of three modules - sensors (smart object modules), network module (gateways) and application (control center) modules [4, 5].
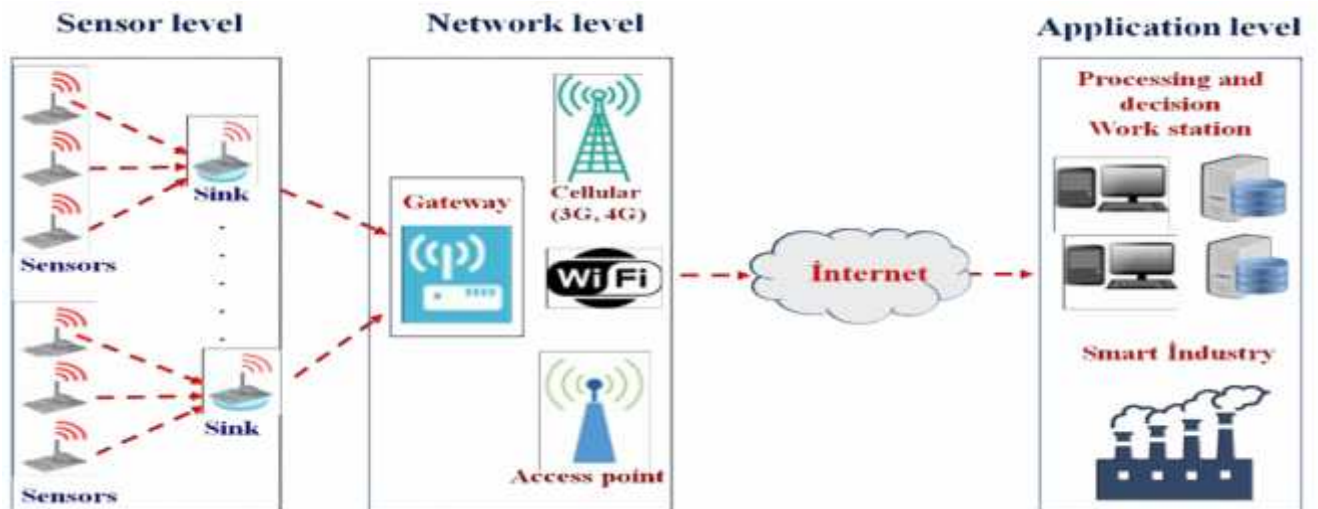
Figure 1. Architecture of Internet of Things Technology

Each module carries out monitoring of various oil field environments related to each other. Three sections of the IoT architecture offered in other sections of the article are explained in detail in their function and interaction. Additionally, possible technologies are proposed that can be applied to ensure the reliability and efficiency of monitoring and other operations in the oil field.

Sensor layer (smart object). Sensor layers consist of sensors installed on different equipment of oil wells and wireless network technologies (3G, 4G, Wi-Fi, ZigBee, etc.)

that connect them. Each smart object (sensors) is a physical device, and most of them are placed in different oil equipment. Smart objects allow you to measure and collect data. Installation of a group of Smart objects on different equipment in oilfield environment is called Smart Oilfield. Signals received from sensors installed for monitoring of oil field pumps (pressure and temperature of pumps, pump outlet, etc.) mainly assists the control process [6].

Network layer (gateways). The network layer is also known as a transmitter layer and is used as an intermediate layer in the Internet architecture of items [7]. The gateway layer basically assures that the data collected on the oil platform is conveyed to the IoT control center or vice versa provides safe transmission of received signals from control center to the sensor layer. Created network controls the installed oil wells devices in several areas, based on the WLAN (Wireless Local Area Network) protocol. In this layer, data is received from the sensor node and if necessary, is encrypted and transmitted to the control center. Because the wells in the oil industry are located far from the center, there is usually no 4G network in these areas and therefore it is important to set up a dedicated wireless network to support the system's service [6].

Application layer (control center). The application layer is implemented as the top layer of the Internet of Things. The Control Center (server) module responds to application control and analysis of data collected from smart object modules. At this layer, automated control of oil pump monitoring is carried out on the basis of the data control and analysis on each well. It collects data and makes important decisions for anomaly events and supports the decision- making process of the control panel. The control center consists of only two layers - network and application layers. The network layer is responsible for the communication between the smart object and control center through communication technologies. The application layer is largely responsible for managing processes and consists of object interfaces, central IoT control servers, IoT applications, databases, visualization tools etc.

The IoT control center receives data from sensors installed on pumps in real time. The collected data (oil well temperature, pressure, flow, etc.) is analyzed through a smart application and management is performed without human intervention after grouping according to types [6]. The Control Center has two primary goals: to analyze information transmitted to the control center from smart objects through different sensors on the state of equipment, detect malfunctions or predict the possibility of their occurrence. Thus, the control center will assist in the implementation of preventive measures to increase productivity and minimize malfunctions, thereby facilitating better control and maintenance of equipment with lower health and safety risks. The second is to analyze data on production performance based on the daily use and production of oil and gas in the control center [4].

IV.APPLICATION OF WIRELESS SENSOR NETWORKS IN OIL- GAS INDUSTRY

WSN technology is a new alternative that significantly reduces costs, facilitates exploitation, flexibility and convenience.During the above processes, there is a need for a wide range of monitoring of various parameters with the help of a large number of sensors. These sensors are installed in different locations for measuring various information about the operation process and operating environment. This is very important for the safety of the production process, production, maintenance plan, optimization of erosion and recovery processes. Sensors, which have been used for many years, have been effectively utilized by cable cables. WSN technology offers faster, less

costly, more flexible, and more convenient choices for monitoring systems. Improvements in the Internet, communication and information technology have also contributed to the development of WSN .

V.CONCLUSION

The article recommends a monitoring system based Internet of Things technology to improve the safety of oil platforms (deposits), optimization of operations, preventing emerging problems, eliminating errors and reducing operational costs based on data collected through sensors in the oil and gas industry. It has been noted that the use of wireless Internet of Things technologies in the sensory network technology has a significant impact on costs' reduction, simplification of exploitation, flexibility and convenience. The issues of ensuring the solution of a number of scientific-theoretical and technological problems in the oil and gas industry through the application of the Internet technologies of items have been analyzed.

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Customer Service For Voice Based Im Bot

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Abstract - IM Bot or conversational interfaces as they are also known, present a new way for individuals to interact with computer systems. Traditionally, to get a question answered by a software program involved using a search engine, or filling out a form. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well- known chatbots currently are voice chatbots: Alexa and Siri. Chatbots are currently being adopted at a high rate on computer chat platforms. The Customer Service chatbot will be built using artificial algorithms that analyze user's *queries and understand user's message. Customer just have to put their query to the* chatbot which is used for chatting. The system will use the artificial intelligence algorithms to give appropriate answers to the user. If the answer is found invalid, then some system to declare the answer as invalid can be incorporated. This system may help Tele-Customers to stay updated with the every user's queries and it will provide an answer.
Keywords- Artificial intelligence, Speech recognition, Chatter box, internet

I. INTRODUCTION

The most well-known Chtabot's currently are voice Chtabot's: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platform. The technology at the core of the rise of the chatbot is natural language processing ("NLP"). Recent advances in machine learning have greatly improved the accuracy and effectiveness of natural language processing, making chatbots a viable option for many organizations. This improvement in NLP is firing a great deal of additional research which should lead to continued improvement in the effectiveness of chatbots in the years to come.

Most commercial chatbots are dependent on platforms created by the technology giants for their natural language processing. These include Amazon Lex, Microsoft Cognitive Services, Google Cloud Natural Language API, Face book Deep Text, and IBM Watson. Platforms where chatbots are deployed include Facebook Messenger, Skype, and Slack, among many others.

In this project AWS service for building conversational interfaces for any applications using voice and text. With Amazon Lex, the same conversational engine that powers Amazon Alexa is now available to any developer, enabling you to build sophisticated, natural language chatbots into your new and existing applications. Amazon Lex provides the deep functionality and flexibility of Natural Language Understanding (NLU) and Automatic. Speech Recognition (ASR) so you can build highly engaging user experiences with lifelike,

conversational interactions, and create new categories of products. Amazon Lex enables any developer to build conversational chatbots quickly.
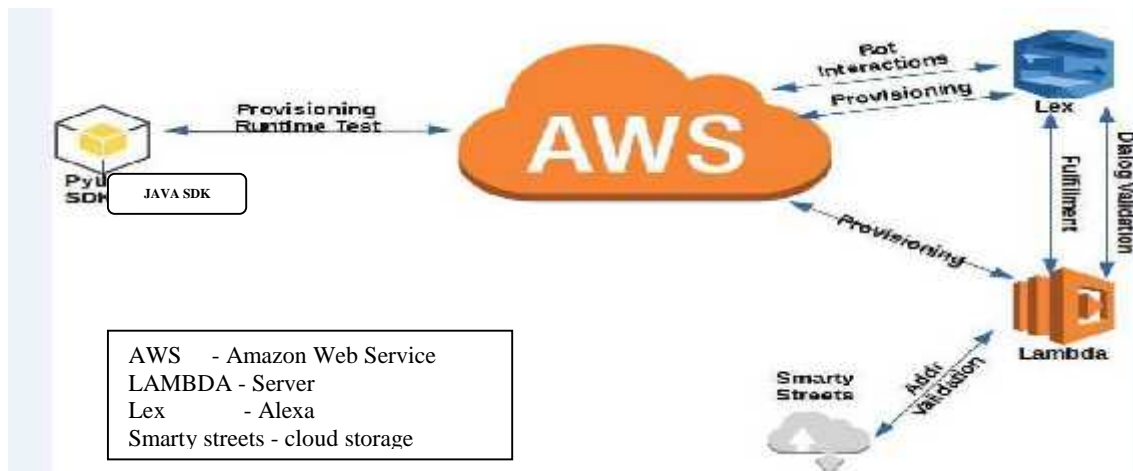
Fig. 1. System Architecture

II. ALGORITHM

"Chatbots are program that interact with humans using natural language" Chatbots are used in many organizational domains where it can replace humans. Such systems are based on the ways ELIZA or ALICE communicates.

2.1ELIZA:

ELIZA is the primary Chabot created by Joseph Weizenbaum utilizing a keyword coordinating strategy. The thought was to persuade the client info and look for certain keywords; if a catchphrase was discovered then the appropriate response was recovered. In the event that a catchphrase is not present then ELIZA would proceed, as per indicated principles, to get more data from the client to keep the discussion going.

2.2 ALICE [Artificial Linguistic Internet Computer Infinity]

ALICE is developed by Richard Wallace in1995. It utilizes design coordinating and stores the data in
Artificial Intelligence Mark-up Language records. An AIML record is like a XML document that is created to store design information for chatbots.

2.3.1 Artificial Intelligent Markup Language [AIML]

AIML[Artificial Intelligent Markup Language], Extensible Markup Language (XML) is the base for derivation of Artificial Intelligence Markup Language (AIML). It has class of data object called an AIML object that describes the behavior of computer programs. It consists of units or tag called topics and categories. In AIML, categories are basic unit of knowledge. Each category consists of pattern which contains input and template which contain answer of chatbot. Besides, there are some optional context called "that" and "topic".

Tag, < that > contain chatbot's last utterance and < topic >contain a collection of categories together.

III. MODULES DESCRIPTION

There are five modules using in this project,

User Interface
- The greeting will ask the customer for their question
- The Initial Greeting will be displayed as soon as the UI is opened.
- The greeting will ask the customer for their question.
- Tools using in HTML, CSS, and Java sdk.

3.1 AWS Interface Module

- AWS is a Web Service provider, it can used to intermediate between User interface module and LAMBDA module.
- Then AWS service is also interact with LEX.

3.1.1 Amazon Web Service:

Amazon Web Services (AWS) is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow. Explore how millions of customers are currently leveraging AWS cloud products and solutions to build sophisticated applications with increased flexibility, scalability and reliability.

3.2 Conversion Module

- Conversion module is a process of exchange the user given input and server replay output.
- The conversion process is done by using LEX tool.
- LEX is used convert in voice to textual data and then text into voice information.

3.2.1 ALEXA

When we communicate with each other, we use a series of nonverbal, verbal, and visual signs— sometimes on their own, sometimes in concert together. This can be as simple as an "mmhm" to let someone know we're listening to them or layered with body language, such as lively hand gestures. As Alexa has developed, so too has her ability to communicate in these same robust ways.

3.3 Lambda Module

- LAMBDA is the one of the server in this project.
- The server which can be act as, the user given input is process by the LEX to return in text input.
- Then text input is send throw cloud database, then input has been check with machine learning algorithm then replay into optimal answer.

3.3.1 AWS Lambda

AWS Lambda is a compute service that lets you run code without provisioning or managing servers. AWS Lambda executes your code only when needed and scales automatically, from a few requests per day to thousands per second. You pay only for the compute time you consume - there is no charge when your code is not running. With AWS Lambda, you can run code for virtually any type of application or backend service - all with zero administration.

3.4 Data Module

- Data module is an database, the admin previously to feed into data.
- Data can be maintained into cloud and internal storage.

3.4.1 Cloud Storage

The term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over public and private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management (CRM) execute on cloud. Cloud Computing refers to manipulating, configuring, and accessing the hardware and software resources remotely.

Output Screenshot

IV. CONCLUSION

Currently chat bots have limited language support and auto streaming. They do not support local languages, dialects and do not understand colloquial usage. Hence there is a great scope for removing such language barriers in future chat bots. Also, AIML templates could be improved to include more variations for the same input. Artificial Intelligence personal assistants integrate various chat bot services into single platform and pave the way for a truly intelligent self-learning activity. Chat bots are also referred to as virtual assistants.

It can be used in the various fields such as education, business, online chatting etc. It can be used in the field of Tele communication learning tool. The information necessary for customer queries can be stored in the data base and can be retrieved any time by querying the bot. In business field, it can be used to provide solutions in a competent way. When the solutions are efficient, the business can be improved and the growth of the Tele service will be increased. This chat bot can be used in online chatting for telecommunication purpose. People can chat with these bots online when they are bored for the purpose of telecommunication. These bots can also be used to learn different kinds of language. The language that has to learnt can be stored in the cloud database and can be learnt by asking questions to the bot. Chat bots are going to explode and can be really dominating in future. Chat bots can provide a new and flexible way for users.

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An Intelligent Processing Apporach To Big Survillence Video Data driven By Smart Front_End Cameras

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Abstract—Face recognition in surveillance video scenarios, identifying a person captured on image or video is one of the key tasks. This resides matching faces on both still images and video sequences. Automatic face recognition for still images with excessive quality can achieve high performance, but for video-based face recognition it is hard to attain similar levels of performance. Compared to still images face recognition, there are several disadvantages present in video sequences. First, images captured by CCTV cameras are generally present in poor quality. The noise level is higher in video, and images may be blurred due to movement or the subject being out of focus. Second, image resolution is basically lower for video sequences. If the subject is present in very far from the camera, the actual face image resolution can be as low as 64 by 64 pixels. Finally, face image variations, such as illumination, expression, pose, occlusion, and motion, are more important in video sequences. The approach can address the unbalanced distributions between still images and videos in a robust way by generating multiple "bridges" to *connect the still images and video frames. So in this project, we can implement still to video matching approach to match the images with videos using Grassmann manifold learning approach to know unknown matches. Finally provide voice alert at the time unknown matching in real time environments. And implement neural network classification algorithms to classify the face images in real time captured videos.*
Index Terms—Secure Net Banking,Multi party access, ICP Feature detection, KNN Classification

I.INTRODUCTION

In imaging technology, image processing is processing of pixel using mathematical operations with the aid of using any shape of signal processing for which the input is an image, a sequence of images, or a video, along with a image and audio; the output of image processing may be either an image or a hard and fast of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional sign and making use of popular sign-processing techniques to it. Images are also processed as three-dimensional alerts with the third-size being time or the z-axis. Image processing usually refers to virtual image processing, however optical and analog image graph processing are also possible. This article is ready standard techniques that practice to

they all. The acquisition of images (generating the enter image within the first region) is known as imaging.

Closely related to image processing are laptop images and computer vision. In computer pictures, images are manually crafted from bodily models of objects, environments, and lights, as opposed to being acquired (via imaging gadgets which includes cameras) from natural scenes, as in maximum animated films. In contemporary sciences and technologies, images also advantage much broader scopes because of the ever developing significance of medical visualization (of regularly massive-scale complex clinical/experimental records). Examples consist of microarray data in genetic research, or actual-time multi-asset portfolio trading in finance. Image evaluation responsibilities can be as simple as studying bar coded tags or as sophisticated as figuring out a person from their face.

Computers are indispensable for the evaluation of huge amounts of statistics, for duties that require complex computation, or for the extraction of quantitative records. On the other hand, the human visible cortex is an superb image graph analysis equipment, in particular for extracting higher-stage information, and for lots packages — which includes medicinal drug, safety, and faraway sensing — human analysts still cannot get replaced with the aid of computers. For this cause, many critical image graph analysis gear such as area detectors and neural networks are stimulated with the aid of human visual perception fashions.

Many graphics based applications are capable of merging one or more images into a single file. The orientation and placement of each image can be controlled to improve efficiency. When selecting a raster image that is not rectangular, it needs identification and separation of the edges from the background, this is also known as silhouetting. This is the virtual analog of cutting out the photograph from a physical photograph. Clipping paths can be used to feature silhouetted images to vector portraits or web page format files that retain vector information. Alpha compositing, lets in for gentle translucent edges when deciding on snap shots. There are some of methods to silhouette an picture with tender edges, which includes deciding on the picture or its heritage by way of sampling comparable colors, choosing the edges by raster tracing, or converting a clipping route to a raster choice. Once the photograph is chosen, it may be copied and pasted into some other phase of the identical record, or into a separate report. The choice may also be saved in what's referred to as an alpha channel. A popular manner to create a composite photo is to use obvious layers. The history image is used as the bottom layer, and the image with parts to be delivered are placed in a layer above that. Using an picture layer mask, all but the elements to be merged are hidden from the layer, giving the affect that those components have been added to the background layer. Performing a merge in this way preserves all of the pixel facts on each layers to extra easily enable destiny modifications in the new merged image.

Video Processing:

Video signal is essentially any collection of time various images. A nonetheless image is a spatial distribution of intensities that remain consistent with time, while a time various image has a spatial intensity distribution that varies with time. Video signal is dealt with as a series of images referred to as frames. An illusion of non-stop video is acquired by means of converting the frames in a quicker manner that is usually termed as frame rate. The demand for digital video is growing in regions including video teleconferencing, multimedia authoring systems, training, and video-on-demand systems.

Spatial Sampling:

The sensitivity of Human Visual System (HVS) varies according to the spatial frequency of an image. In the digital illustration of the picture, the value of every pixel desires to be quantized using some finite precision. In exercise, 8 bits are used in keeping with luminance pattern.

Temporal sampling:

A video consists of a sequence of images, displayed in rapid succession, to provide an illusion of non-stop movement. If the time gap between successive frames is too large, the viewer will take a look at jerky movement. The sensitivity of HVS drops off extensively at excessive frame rate. In exercise, maximum video codecs use temporal sampling costs of 24 frames consistent with second and above. Video codecs Digital video consists of video frames which are displayed at a prescribed frame rate. The basic frame rate is 30 frames per second. The frame layout specifies the size of character frames in phrases of pixels. The Common Intermediate Format (CIF) has 352 x 288 pixels, and the Quarter CIF (QCIF) layout has 176 x 144 pixels.

Frame types:

Three styles of video frames are I-frame, P-frame and B-frame. 'I' referred for Intra coded frame, 'P' stands for Predictive frame and 'B' stands for Bidirectional predictive frame. 'I' frames are encoded without any motion compensation and are used as a reference for future anticipated 'P' and 'B' kind frames. 'I' frames but require a enormously large number of bits for encoding. 'P' frames are encoded the usage of movement compensated prediction from a reference frame which can be both 'I' or 'P' frame. 'P' frames are extra efficient in terms of wide variety of bits required in comparison to 'I' frames, however still require more bits than 'B' frames. 'B' frames require the lowest variety of bits compared to both 'I' and 'P' frames however incur computational complexity. Frames between two successive 'I' frames, consisting of the leading 'I' frame, are collectively known as as Group of Pictures (GOP). It has one 'I' frame, two 'P' frames and six 'B' frames. Typically, more than one 'B' frames are inserted between two consecutive 'P' or between 'I' and 'P' frames. The lifestyles of GOPs helps the implementation of functions such as random get admission to, rapid forward or fast and everyday opposite playback. Video processing era has revolutionized the world of multimedia with products including Digital Versatile Disk (DVD), the Digital Satellite System (DSS), and High Definition TV (HDTV), virtual nevertheless and video cameras. The exclusive regions of video processing includes (i) Video Compression (ii) Video Indexing (iii) Video Segmentation (iv) Video monitoring and many others.

Video Indexing:

Video indexing is necessary to facilitate efficient content-based retrieval and browsing of visual information stored in large multimedia databases. To create an efficient index, a set of representative key frames are selected which capture and encapsulate the entire video content. **Subsampling:**

The simple idea of subsampling is to reduce the size of the input video (horizontal measurement and / or vertical size) and for that reason the range of pels to be coded previous to encoding system. At the receiver side decoded images are interpolated for display. This method may be considered as one among most primary compression techniques which also uses particular physiological traits of the human eye and for that reason gets rid of subjective redundancy contained inside the video information. This concept is also used to discover subjective redundancies contained in chrominance statistics, i.e., human eye is more touchy to modifications in brightness than to chromaticity changes. RGB format is not favored due to the fact R, G, B components are correlated and transmitting R, G, B components one after

the other is redundant. To triumph over this, the input photo is split into YUV components (one luminance and chrominance components). Next, the chrominance components are subsampled relative to luminance element with a Y:U:V ratio particular to unique programs. Subsampling is denoted inside the layout X: X: X, where the primary digits represent the quantity of luminance samples, used as a reference and usually "4". The second and third digits are the wide variety of chrominance samples, with recognize to the quantity of Y samples.

Video compression performs an critical function in many virtual video applications consisting of virtual libraries, video on call for, and excessive definition television. A video sequence with body length of 176 X a hundred and forty four pixels at 30 frames in keeping with 2d and 24 bits in keeping with pixel would require 18.25 Mbps, making it impractical to transmit the video collection to transmit over standard phone traces in which statistics costs are commonly confined to 56,000 bits consistent with 2nd. This example illustrates the need for video compression. Effective video compression can be carried out by minimizing each spatial and temporal redundancy. A video consists of a series of frames in order to compress the video for efficientstorage and transmission, the temporal redundancy amongst adjacent frames should be exploited. Temporal redundancy means that adjoining frames are similar whereas spatial redundancy means that neighboring pixels are comparable. Video coding interprets video sequences into an efficient bit stream. This translation includes the removal of redundant statistics from video sequence. Video sequence contains styles of redundancies spatial and temporal. Removal of spatial redundancy is typically termed as interframe coding and removal of temporal redundancy is called as interframe coding. Video compression algorithms can be extensively labeled into kinds (i) Lossless video compression and (ii) Lossy video compression. Due to its significance in multimedia programs, most of the algorithms in video compression has focused on lossy video compression. Lossless video compression is vital to applications in Luminance sample (Y) Chrominance pattern (U, V) 7 which the video nice cannot tolerate any degradation including archiving of a video, compression of scientific and satellite TV for pc motion pictures and so forth. Interframe coding removing the spatial redundancy with a frame is normally termed as interframe coding. The spatial redundancy inside a body is minimized with the aid of the use of remodel. The commonly used remodel is Discrete Cosine Transform. Interframe coding the temporal redundancy among successive frames is removed by using interframe coding. Interframe coding exploits the interdependencies of video frames. Interframe coding relies at the fact that adjacent photographs in a video collection have excessive temporal correlation. To decrease the temporal correlation, a frame is chosen as a reference, and subsequent frames are anticipated from the reference.

II. RELATED WORK

Y. Yan, et al., [1] in this paper, we propose a novel active sample selection approach (a.k.a. active learning) for image classification by using web images. Previous research has shown that cross-media modeling of various media types is beneficial for multimedia content analysis. The web images are often associated with rich textual descriptions (e.g., surrounding texts, captions, etc.). While such text information is not available in testing images, we show that text features are useful for learning robust classifiers, enabling better active learning performance of image classification. Typical active sampling methods only deal with one media type which cannot simultaneously utilize different media types. The new supervised learning paradigm, namely learning using privileged information (LUPI), can be used to solve this problem. In a LUPI scenario, in addition to main features, there is also privileged information available in the training procedure. Privileged information can only be

used in training, and is not available in testing. Uncertainty sampling is the most frequently used strategy in the active learning. In this work, we propose to exploit both visual and text features for active sample selection by taking text as privileged information. By LUPI, we train SVMs on visual features and slacking function on text features.

Y. Yang, et al., [2] In this work, we propose a new feature selection algorithm, which leverages the knowledge from related multiple tasks to improve the performance of feature selection. In our study, the following lessons have been learned: Sharing information among related tasks is beneficial for supervised learning. However, if the multiple tasks are not correlated, the performance is not necessarily improved. Compared to single task learning, the advantages of multitask learning are usually more visible when we only have few training examples per task. As we increase the number of positive training data, the intra-task knowledge is sufficient for training, and thus adapting inter-task knowledge does not necessarily help. It is not always the case that feature selection improves the performance. However it is still beneficial because it improves the efficiency. Also, feature selection would provide us with better interpretability of the features. The improvement of feature selection varies when different classifiers are used. For example, since linear SVM actually has the ability to assign different weights to different features, the performance improvement of SVM is less than KNN, after feature selection. We give the objective function. The optimization approach is proposed, followed by the proof of its convergence.

X. Chang, et al., [3]in this paper, we aim to solve the limitations of the existing discriminant analysis algorithms for high-order data and propose a compound rank-k projection algorithm for discriminant bilinear analysis. Different from, the convergence of our optimization approach is explicitly guaranteed. We adopt multiple orthogonal projection models to obtain more discriminant projection directions. In particular, we use h sets of projection matrices to find a low dimensional representation of the original data. The h projection matrices are orthogonal to each other. In this way, a larger search space is provided to find the optimal solution, which will yield better classification performance. We name the proposed algorithm as Compound Rank-k Projection for Bilinear Analysis (CRP). It is worthwhile noting that the algorithm can be readily extended to high-order tensor discriminant analysis. The main contributions of our work can be summarized as CRP can deal with matrix representations directly without converting them into vectors. Hence, spatial correlations within the original data can be preserved. The rest of this work is organized as summarizes an overview of the classical LDA as well as 2DLDA. A novel compound rank-k projection for bilinear analysis is proposed.

Y. Yang, et al., [4]in this paper, we propose a framework consisting of two algorithms for multimedia content analysis and retrieval. First, a new transductive ranking algorithm, namely, ranking with Local Regression and Global Alignment (LRGA), is proposed. Differently from distance-based ranking methods, the distribution of the samples in the whole data set is exploited in LRGA. Compared with the inductive methods, only the query example is required. In contrast to the MR algorithm that directly adopts the Gaussian kernel to compute the Laplacian matrix, LRGA learns a Laplacian matrix for data ranking. For each data point, we employ a local linear regression model to predict the ranking scores of its neighboring points. In order to assign an optimal ranking score to each data point, we propose a unified objective function to globally align local linear regression models from all the data points. In retrieval applications, there is no ground truth to tune the parameters of ranking algorithms like MR. Therefore, it is meaningful to develop a new method that learns an optimal Laplacian matrix for data ranking. Second, we propose a semi-supervised learning algorithm for long-term RF. A system log is constructed to record the history RF information marked by all of the users. We refine the vector representation of multimedia data according

to the log information via a statistical approach. To that end, we convert the RF information into pairwise constraints, which are classified into two groups. The data pairs in the first group are semantically similar to each other, while the data pairs in the second group are dissimilar to each other. While LDA can be used to exploit these two types of information, the valuable information in the unlabeled data is not utilized.

Olutola Fagbolu, et al., [5]the contribution of this paper is 3-fold. Firstly, we endorse a filter out pairing neural network (FPNN) for character re-identity. This deep studying method has numerous vital strengths and novelties as compared with existing works. It collectively handles misalignment, imagemetric and geometric transforms, occlusions and background muddle beneath a unified deep neural community. During education, all of the key components are at the same time optimized. Each component maximizes its strength whilst cooperating with others. Instead of the usage of handcrafted capabilities, it routinely learns most beneficial capabilities for the challenge of man or woman re-identification from records, collectively with the gaining knowledge of imagemetric and geometric transforms. Two paired filters are implemented to different camera perspectives for feature extraction. The filter pairs encode imagemetric transforms. While present works anticipate move-view transforms to be uni-modal, the deep structure and its maxout grouping layer allow modeling an aggregate of complex transforms. Secondly, we train the proposed neural community with carefully designed education techniques along with dropout, records augmentation, records balancing, and bootstrapping. These strategies deal with the troubles of misdetection of patch correspondence, over fitting, and excessive unbalance of nice and negative education samples in this venture. Thirdly, we re-observe the person re-identification trouble and construct a massive scale dataset that could compare the effect brought via automatic pedestrian detection.

III.EXISTING METHODOLOGIES

The term multi-view face reputation, in a strict sense, only refers to conditions wherein a couple of cameras gather the subject (or scene) concurrently and an algorithm collaboratively utilizes the received images/motion pictures. But the time period has frequently been used to recognize faces across pose versions. This ambiguity does now not purpose any hassle for reputation with (nonetheless) pixels; a set of images simultaneously considering more than one cameras and people involved in a single camera but at one of a kind view angles are equivalent as some distance as pose versions are worried. However, inside the case of video statistics, the two instances diverge. While a multi-digital camera gadget ensures the purchase of multi-view facts at any second, the risk of acquiring the equivalent records through the usage of a single digicam is unpredictable. Such differences turn out to be vital in non-cooperative recognition programs together with surveillance. For clarity, we will name the more than one video sequences captured by synchronized cameras a multi-view video and the monocular video collection captured when the subject changes pose, a single-view video. With the superiority of digital camera networks, multi-view surveillance motion pictures have end up increasingly not unusual. Nonetheless, most current multi-view video face reputation algorithms take advantage of unmarried-view films. Given a pair of face photos to confirm, they look up inside the collection to "align" the face element's look in a single photograph to the same pose and illumination of the other photograph. This approach will also require the poses and illumination conditions to be predicted for both face

snap shots. This "general reference set" idea has also been used to increase the holistic matching algorithm, in which the ranking of look-up consequences forms the premise of matching degree. There also are works which handles pose versions implicitly without estimating the pose explicitly.

IV. FACE CLASSIFICATION USING GRASSMANN ALGORITHM

Face detection is the primary level of a face recognition system. A lot of research has been completed in this vicinity, maximum of that's efficient and powerful for still images simplest & could not be applied to video sequences without delay. Face recognition in videos is a present topic in the field of image processing, computer imaginative and prescient and biometrics over many years. Compared with still face popularity images comprise more abundant facts than a single image so video include spatial-temporal statistics. To enhance the accuracy of face popularity in movies to get more robust and strong recognition can be accomplished via fusing records of multi frames and temporal data and multi poses of faces in videos make it possible to explore form information of face and combined into the framework of face reputation. The video-based fully reputation has extra advantages over the photo-based fully reputation. First, the temporal statistics of faces can be applied to facilitate the recognition challenge. Secondly, greater effective representations, which include face version or superb-resolution images, can be acquired from the video series and used to improve reputation consequences. Finally, video- based fully recognition permits mastering or updating the situation version over the years to enhance popularity effects for future frames. So video based totally face recognition is also a totally hard hassle, which suffers from following nuisance elements inclusive of low satisfactory facial photos, scale variations, illumination adjustments, pose variations, Motion blur, and occlusions and so forth.

In the video scenes, human faces can have limitless orientations and positions, so its detection is of a spread of demanding situations to researchers. In current years, multi-camera networks have turn out to be more and more not unusual for biometric and surveillance structures. Multi view face reputation has come to be an energetic studies place in current years. In this paper, a technique for video-based face reputation in digital camera networks is proposed. Traditional processes estimate the pose of the face explicitly. A strong function for multi-view reputation this is insensitive to pose versions is proposed in this task. The proposed function is advanced the use of the round harmonic illustration of the face, texture mapped onto a sphere. The texture map for the complete face is constructed by using again-projecting the photograph intensity values from every of the perspectives onto the surface of the round version. A particle filter is used to track the 3-D vicinity of the pinnacle the use of multi-view facts. Videos provide an automated and efficient way for characteristic extraction. In specific, self-occlusion of facial capabilities, because the pose varies, raises essential demanding situations to designing sturdy face recognition algorithms. A promising method to address pose variations and its inherent demanding situations is the use of multi-view statistics. In video based face reputation, awesome achievement has been made with the aid of representing movies as linear subspaces, which usually lie in a unique form of non-Euclidean space referred to as Grassmann manifold.

To leverage the kernel-primarily based strategies advanced for Euclidean area, several current strategies were proposed to embed the Grassmann manifold right into a high dimensional Hilbert area by using exploiting the well-set up Project Metric, which can approximate the Riemannian geometry of Grassmann manifold. Nevertheless, they unavoidably introduce the drawbacks from conventional kernel-based methods which include implicit map and excessive computational price to the Grassmann manifold. To triumph over

such obstacles, we advocate a singular approach to learn the Projection Metric at once on Grassmann manifold in place of in Hilbert space. From the angle of manifold gaining knowledge of, our technique can be appeared as performing a geometry-aware dimensionality discount from the unique Grassmann manifold to a lower-dimensional, greater discriminative Grassmann manifold in which extra favorable category may be done. And also provide neural community classification algorithm to categories faces with progressed accuracy. Finally offer voice based totally alert machine with actual time implementation.

4.1 ALGORITHM : Grassmann algorithm

Representing the facts on Grassmann manifolds is famous in some image and video recognition responsibilities. In unique, we design complete rank mapping layers to convert input Grassmannian records into extra desirable ones, make the most orthogonal re-normalization layers to normalize the ensuing matrices, observe projection pooling layers to reduce the version complexity in the Grassmannian context, and devise projection mapping layers to show the ensuing Grassmannian information into Euclidean forms for ordinary output layers. To train the deep community, we make the most a stochastic gradient descent placing on manifolds in which the connection weights are living on, and have a look at a matrix generalization of returned propagation to replace the established statistics. The famous packages of Grassmannian records inspire us to construct a deep neural network architecture for Grassmannian representation studying. For this motive, the new community architecture is designed to take Grassmannian statistics at once as enter, and learns new favorable Grassmannian records which might be able to improve the final visual responsibilities. In other phrases, the new community pursuits to deeply examine Grassmannian facts on their underlying Riemannian manifolds in a stop-to-give up getting to know structure. To perform discriminant gaining knowledge of on Grassmann manifolds, many works embed the Grassmannian into a Euclidean space. This may be finished both by way of tangent space approximation of the underlying manifold, or with the aid of exploiting a high-quality particular kernel function to embed the manifold into a reproducing kernel Hilbert space. In each of such cases, any present Euclidean method can then be carried out to the embedded information, considering that Hilbert spaces respect Euclidean geometry. For example, first embeds the Grassmannian into a high dimensional Hilbert area, and then applies conventional Fisher analysis approach. Obviously, most of those techniques are restricted to the Mercer kernels and consequently constrained to apply best kernel primarily based classifiers. Moreover, their computational complexity increases steeply with the range of education samples.

The Grassmann manifold G (m, D) is the set of m-dimensional linear subspaces of the R and D. The G (m, D) is anm (D−m)-dimensional compact Riemannian manifold.

An element of G (m, D) can be represented by an orthonormal matrix Y of size D by m such that Y = I'm, where I'm is the m by m identity matrix. For example, Y can be the m basis vectors of a set of pictures in R D.

However, the matrix representation of a point in G (m, D) is not unique: two matrices Y1 and Y2 are considered the same if and only if span (Y1) = span (Y2), where span(Y)represents the subspace spanned by the column vectors of Y. Equivalently, span (Y1) = span (Y2) if and only if Y1R1 = Y2R2 for some R1, R2   O (m). With this understanding, herewill often use the notation Y when we actually mean its equivalence class span(Y), and use Y1 = Y2 when we mean span (Y1) = span (Y2), for simplicity.

Formally, the Riemannian distance between two subspaces is the length of the shortest geodesic connecting the two points on the Grassmann manifold. However, there is a

more intuitive and computationally efficient way of defining the distances using the principal angles.

V.EXPERIMENTAL RESULTS

Experimental results have the results of the proposed work. Proposed work was implemented using C#.NET is a front end and SQL is a back end process. This shows that the proposed work achieves higher security in home monitoring system with secure video sharing.

Fig 5.1: Face Registration

Above figure shows the face registration process. Here user face image was captured using real time camera process.

Fig 5.2: Face Feature Extraction Module

This figure shows the face detection module. Here user face image is captured in real time. Then extract the facial features. Extracted features are labeled then stored on database.

Fig 5.3: Face Verification

This figure shows the face verification process. Currently captured face image is comparing with data base using facial features. When features are matched with database it will show person details.

Fig 5.4: Unknown Face Detection

Above figure shows the unknown face detection module. Features of the currently captured image are compared with database. When mismatch occurs on the features it will display the unknown face detection. Also send the alert message and unknown face image to the specified mobile number and email id.

VI.CONCLUSION

In this project, we reviewed face recognition technique for still images and video sequences. Most of these present approaches need nicely-aligned face images and handiest carry out either nevertheless picture face recognition or video-to video in shape. They are not suitable for face recognition under surveillance scenarios because of the following reasons: limitation in the number (around ten) of face images extracted from each video due to the

large variation in pose and lighting change; no guarantee of the face image alignment resulted from the poor video quality, constraints in the resource for calculation influenced by the real time processing. Then proposed a local facial feature extractionbased framework for still image and video-based face recognition under surveillance conditions. This framework is work on the basis of still-to-still, still-to-video and video-to video matching in real-time. While the training process uses static images, the recognition task is performed over video sequences. Our results show that higher recognition rates are obtained when we use video sequences rather than statics – even when the algorithm using static images and that using video sequences address the same problems with exactly the same techniques. Evaluation of this approach is done for still image and video based face recognition on real time image datasets.

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A Novel Technique For Unsupervised Forensics Analysis Of Video File Container

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Abstract—Nowadays, with the ongoing development of video editing techniques, it becomes increasingly easy to modify the digital videos. How to identify the authenticity of videos has become an important field in information security. Video forensics aims to look for features that can distinguish video forgeries from original videos. Thus people can identify the authenticity of a given video. A kind of distinguishing method which is based on video content and composed of copy-move detection and inter-frame tampering detection becomes a hot topic in video forensics. In the current times the level of video forgery has increased on the internet with the increase in the role of malware that has made it possible for any user to upload, download and share objects online including audio, images, and video. Specifically, Video Editor and Adobe Photoshop are some of the multimedia software and tools that are used to edit or tamper medial files. Added to this, manipulation of video sequence in a way that objects within the frame are inserted or deleted are among the common malicious video forgery operations. In this paper, video forgery is detected that use video forgery detection in the form of features extraction from frames and matched with original videos and can implement Scale Invariant Feature Transform (SIFT) are improved for detection of copy move attacks. In this method, firstly image key points are extracted and multi-dimensional feature vector named as SIFT descriptor is generated for each key point. Then, these key points are matched using distance among their descriptors. Although this method is good at detection of copy move attacks. We can provide results about total percentage of forged and identify which frame to be forged. And design the application as window based application with image processing techniques.

Index Terms—Video forgery, Features Extraction, Key points, Query frames, Reference frames, SIFT features

INTRODUCTION

Computer forensics (also known as computer forensic science) is a branch of digital forensic science pertaining to evidence found in computers and digital storage media. The goal of computer forensics is to examine digital media in a forensically sound manner with the aim of identifying, preserving, recovering, analyzing and presenting facts and opinions about the digital information. Although it is most often associated with the investigation of a wide variety of computer crime, computer forensics may also be used in civil proceedings.

The discipline involves similar techniques and principles to data recovery, but with additional guidelines and practices designed to create a legal audit trail. Evidence from computer forensics investigations is usually subjected to the same guidelines and practices of other digital evidence. It has been used in a number of high-profile cases and is becoming widely accepted as reliable within U.S. and European court systems.

Digital video evidence is most commonly created by passive and active recording systems. A passive recording system is a recording system that doesn't store information in its memory system. An active recording system is a recording that stores information in its memory system. Active recording systems are most commonly produced with a digital storage medium such as a HDD, SSD or Volatile (flash) memory. Video recorders create digital video recordings in these types of formats:

Open source format: An open source format is a file format for storing digital data, defined by a published specification usually maintained by a standards organization, and which can be used and implemented by anyone.

Proprietary format: A proprietary format is a file format of a company, organization, or individual that contains data that is ordered and stored according to a particular encoding-scheme. This scheme is designed by the company or organization to be secret, such that the decoding and interpretation of this stored data is easily accomplished only with particular software or hardware that the company itself has developed. These formats are more common when video evidence is extracted directly from the system that created it, because they are a more secure and higher quality formatting. These proprietary formats also contain digital information like Meta Data and Telemetry Data that can assist a video forensic investigation.

Courtroom ready format: A copy of the video recording that is easily playable in a court of law using a computer, projection system, or large television. This digital format today should be tested on the system that it will be played through prior to presentation in court. Often times this format is deliverable in the form of a flash drive, DVD or Data Disc. Although the playable copy will be encoded in a common video format (MP4, AVI, WMV) it still may require a freeware player like VLC player or DVD playback software to advance frames as well as play or decode smoothly. Forensic video analysis and authentication is the scientific processes performed by a trained video forensic expert in order to determine events that occurred at the time of the video recording. CCTV cameras do not see the same as the human eye. Some of the video recordings we examine in our lab have been altered either with malice or unintentionally using processes that alter the integrity of the evidence. As video forensic experts we help our client attorneys understand any anomalies in the video recording we are asked to analyze and perform several scientific tests to determine the nature of any anomalies. The existence of digital video and digital image editing tools has made it challenging to accurately authenticate multimedia content. The current manipulation technique and the dynamic multimedia technology evolution made it possible even for a novice to easily delete an object from a video sequence, or add an object from another video source, or insert an object developed by graphics software designer. It has become complicated to comprehend and differentiate an authentic video from a tampered one. The basic layout forgery detection is shown in fig 1.
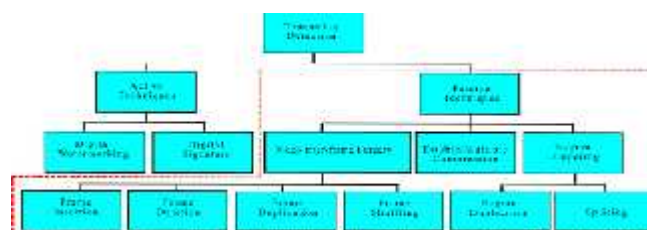

Fig 1: Tampering detection techniques

II. RELATED WORK

Hao Yin, et.al,…[1] proposed, designed, and implemented a novel large-scale Digital Forensics Service Platform (DFSP) that can effectively detect illegal content from Internet videos. More specifically, we propose a distributed architecture by taking advantage of Content Delivery Network (CDN) to improve scalability, which can process enormous number of Internet videos in real time. We propose CDN-based Resource-Aware Scheduling (CRAS) algorithm, which schedules the tasks efficiently in the DFSP according to resource parameters, such as delay and computation load. We deploy the DFSP system in the Internet, which integrates the CDN-based distributed architecture and CRAS algorithm with a large-scale video detection algorithm, and evaluate the deployed system. Our evaluation results demonstrate the effectiveness of the platform. To date, most existingforensics systems focus on how to deal with robustnessand identification accuracy, which have not consideredhow to detect the legality of large-scale Internet videos in realtime. There are fewer reported works on the efficiency and scalabilityfor large-scale video content identification, whichmainly focus on solving these problems from video retrieval algorithmperspective.

Thomas Stutz, et.al. [2] Has been researched intensely and is of great interest due to its wide applicability in the context of DRM (digital rights management). This paper presents a novel H.264 CAVLC watermarking technique that allows implementing watermarking by simple and efficient bit substitutions of the compressed bit-stream (substitution watermarking). Additionally our algorithm is structure preserving, i.e., precisely preserves the length of the bit stream and even of the bit stream's smaller units. In the case of H.264, structure preserving watermarking denotes watermarking algorithms in which the network-abstraction layer units (NAL units / NALUs are small units which form the entire H.264 bit stream) have exactly the same length in the watermarked content and the original content. The structure preservation for H.264 is required for the watermarking of Blu-Ray content. The length preservation is required as the video has to fit on a Blu-Ray disc. The internal structure has to be preserved as often byte- based addressing schemes are employed in production and presentation, e.g., the meta-data on Blu-Ray discs employs byte-based addressing schemes. Blu-Ray players can enhance the presentation with additional online content, which employs byte-based addressing (BD-J) as well.

Xiaoping Feng, et.al. [3] Attempted to identify the variety of processing steps that a signal has undergone. Such information is useful in determining whether, for example, a signal is authentic or has been tampered with. There are two main approaches to multimedia forensics: active forensics and passive forensics. Active forensics relies on modifying the multimedia signal prior to its distribution to assist in later forensic analysis. Digital watermarks are one example of active forensics. A limitation of active forensics is the need for content-generating devices, e.g. cameras, sensors, microphones, that embed watermarks. Such devices are often not available, and in these cases active forensics cannot be applied. Passive forensics, in contrast, does not rely on any prior modification of the signal. As such, passive forensics is, in theory, applicable to a broader range of operating scenarios. We propose a new method to detect resampled imagery.The method is based on examining the normalized energydensity present within windows of varying size in the secondderivative of the image in the frequency domain, and exploitingthis characteristic to derive a 19-D feature vector that is used totrain a SVM classifier. Experimental results are reported on 7500raw images from the BOSS database. Comparison with priorwork reveals that the proposed algorithm performs similarly forresampling rates greater than 1, and is superior to prior workfor resampling rates less than 1. Experiments are performed forboth bilinear and cubic

interpolations, and qualitatively similarresults are observed for each. Results are also provided for thedetection of resampled imagery with noise corruption and JPEGcompression.

Subramanian, et.al,[4] implemented the techniques which using the digital video editing techniques is constantly increasing the difficulty in distinguishing the authentic video from the tampered one. For example the authors refer to the forgery created in a popular film Speed by duplicating the frames thereby hiding any activity actually going on. The copy-paste tampering can be performed in a convincing manner without much of difficulty. And copy-paste tampering can be practically difficult to detect. Therefore, it is likely that copy-paste tampering can be often applied to forge a video. However, in order to detect such forgeries, intrinsic properties of captured media can be used. In this paper, we use the intrinsic properties of the captured media to detect the copy-paste tampering in a video. The copy-paste video forgeries can be classified into two different categories - spatial tampering and temporal tampering. In spatial tampering, a region may be copied from a location in a frame and pasted to a different location on the same frame or other frames possibly after some modification. One of the challenges in detecting video copy-paste forgery is to find the robust representations for the video frame blocks, so that the duplicated blocks can be identified even after modifications. In image forgery detection features such as SIFT, transforms such as FMT have been used. While in video forgery detection normalized correlation noise characteristics or quantization parameters have been used. Although features such as SIFT give good forgery detection performance owing to their robustness, other features such as SURF or HoG can also be used for detection purpose.

Chi-Man Pun et.al,…[5] implemented the techniques for analyzed the source of information, and the reliability of digital images is thus becoming an important issue. In recent years, more and more researchers have begun to focus on the problem of digital image tampering. Of the existing types of image tampering, a common manipulation of a digital image is copy-move forgery, which is to paste one or several copied region(s) of an image into other part(s) of the same image. During the copy and move operations, some image processing methods such as rotation, scaling, blurring, compression, and noise addition are occasionally applied to make convincing forgeries. Because the copy and move parts are copied from the same image, the noise component, color character and other important properties are compatible with the remainder of the image; some of the forgery detection methods that are based on the related image properties are not applicable in this case. In previous years, many forgery detection methods have been proposed for copy-move forgery detection. A novel copy-move forgery detection scheme using adaptive over-segmentation and feature point matching is proposed in this paper. The proposed scheme integrates both block-based and key point-based forgery detection methods. First, the proposed Adaptive Over-Segmentation algorithm segments the host image into non-overlapping and irregular blocks adaptively. Then, the feature points are extracted from each block as block features, and the block features are matched with one another to locate the labeled feature points; this procedure can approximately indicate the suspected forgery regions.

III. EXISTING METHODOLOGIES

In recent years due to easy availability of video and image editing tools it has become a difficult task to authenticate the multimedia content. Due to the availability of inexpensive and easily-operable digital multimedia devices (such as digital cameras, mobiles, digital recorders, etc.), together with high-quality data processing tools and algorithms, has made signal acquisition and processing accessible to a wide range of users. As a result, a single image or video can be processed and altered many times by different users. This fact has

severe implications when the digital content is used to support legal evidences since its originality and integrity cannot be assured. Important details can be hidden or erased from the recorded scene, and the true original source of the multimedia material can be concealed. Moreover, the detection of copyright infringements and the validation of the legal property of multimedia data may be difficult since there is no way to identify the original owner. Digital videos and images having fraudulent content are used for illegal activities. Therefore, integrity of digital content needs to be verified. This can be done by analyzing the properties of the digital media. The existing method divides the test video into frames, and partitions each frame into non-overlapping 12×12 sub-blocks. It applies discrete cosine transform (DCT) to each sub-block at each frame and transforms them into the frequency domain. Average DCT value for each sub-block is calculated, and a row vector is obtained from each frame that contains averaged DCT values. The obtained row vectors for each frame are then binarized. The proposed method calculates a correlation matrix from binary row vectors and creates a correlation image for the current test video. Brighter pixels in the correlation image denote similar frames. The existing framework is shown in fig 2.
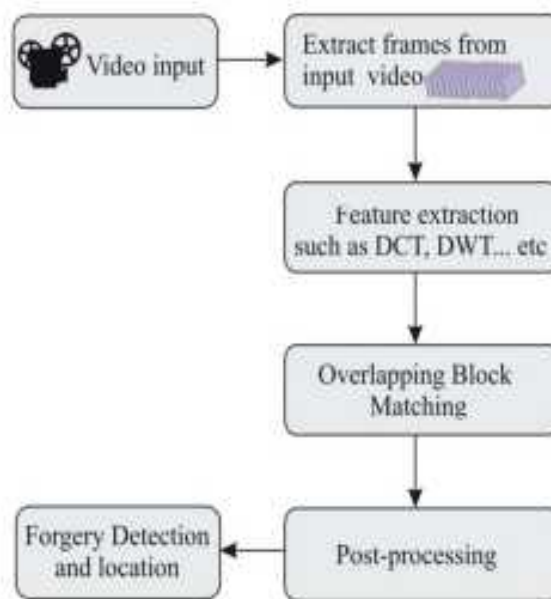
Fig 2: Existing approaches

IV. PROPOSED METHODOLOGY

Presently in the digital era, our day to day life is permeated with digital video contents as one of the prominent means for communication. Developments in video technologies such as generation, transmission, storage and retrieval along with applications like Video sharing platforms, Video-conferencing etc. have served the people and society in many ways. In the terms of social, economic and scientific development, the images and videos available on various video sharing and social networking platforms like YouTube, Face Book, Instagram etc. are of symbolic importance. Besides this, other applications like entertainment industry, video surveillance, legal evidence, political videos, video tutorials, advertisements, etc. signify their unprecedented role in today's context. As a matter of fact, videos can be generated, stored, transmitted and processed in digital format in a easy way, because of extensive use of the Internet and inexpensive and high quality cameras, computers and user-friendly editing tools. Any novice individual can utilize these techniques to make unauthorized modifications to the video content thereby affecting its integrity and

authenticity. This possibility arises the need to validate whether the multimedia content available on the internet, obtained as a part of video surveillance system, or received by a broadcaster, is original or not. Thus along with the exemplary behavior of videos comes forward a gloomy side to it which is misusing or inaccurate projection of information through videos. Intentional modification or alteration of the digital video for fabrication is referred to as Digital Video Forgery. Video forgery refers to manipulating a video in such a way that it changes the content perceptually. Video Forgery can be as simple as inserting advertisements during broadcasting of sporting events or as complex as removing people digitally from a video. Video Forgery can be divided into two parts Spatial Forgeries and Temporal Forgeries. When a video sequence is captured, there is typically a great deal of redundancy between the successive frames of video. The MPEG video compression technique exploits this redundancy by predicting certain frames in the video sequence from others, then by encoding the residual difference between the predicted frame and the actual frame. Because the predicted difference can be compressed at a higher rate than a frame in its entirety, this leads to a more efficient compression scheme. Performing compression in this manner has its drawbacks, however, because error introduced from one frame will propagate to all frames predicted from it. To prevent error propagation, the video sequence is divided into segments, where each segment is referred to as a group of pictures (gop). Frame prediction is performed within each segment, but never across segments, thus preventing decoding errors in one frame from spreading throughout video sequence. Within each group of pictures, frames are divided into three types: intra-frames (I-frames), predicted-frames (P-frames), and bidirectional-frames (B-frames). Each gap begins with an I-frame, followed by a number of P-frames and B-frames. No prediction is performed when encoding I-frames; therefore each I-frame is encoded and decoded independently. During encoding, each I-frame is compressed through a loss process similar to JPEG compression. P-frames are predicatively encoded through a process known as motion estimation. SIFT features are extracted from gray-level image and tend to be invariant to most of the post processing methods. They are used in a variety of image processing applications ranging from medical to space based application. It is the most widely studied algorithm and also has a variety of modified versions to it.
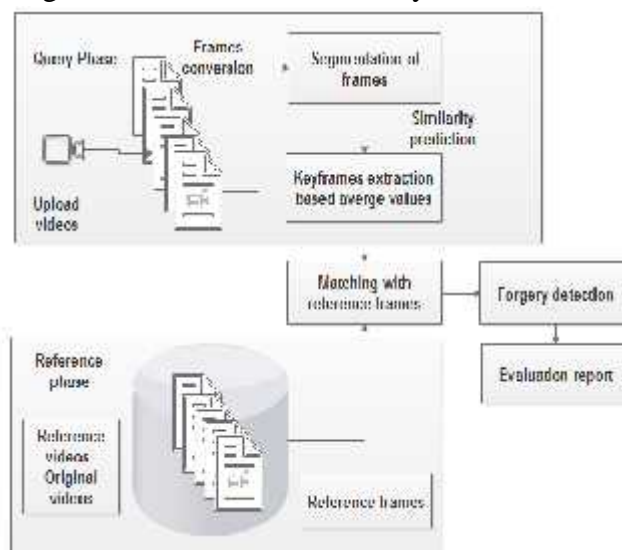
Fig 3: Proposed framework

4.1 VIDEO ACQUISITION:

In this module, we can upload the videos that are considered as query videos. Admin can have original videos which are known as reference videos. We can convert the videos into frames at every 0.5 seconds using video file reader coding. Each frame is considered as single image.

4.2 VIDEO FEATURES EXTRACTION:

Feature extraction involves reducing the amount of resources required to describe a large set of data. When performing analysis of complex data one of the major problems stems from the number of variables involved. Feature extraction is a general term for methods of constructing combinations of the variables to get around these problems while still describing the data with sufficient accuracy. In this module, we can extract the features of each frame such as color, shape of object, background features and so on. These features are extracted for future integrity checking.

4.3 SEGMENTATION OF VIDEOS:

Segmentation means grouping of frames based on video features. Video segmentation is a ways of dividing frames into meaningful segments. In the context of video capture, segmentation is best applied to captured screen presentation that the presenter goes through slide after slide. The program compare and calculate the similarity of each video frames to consider whether there is a change in the scenery or not. If they are a change, we break the video here and finally we will break the video into shots. We assume the first frame of each shot as the key frame and output the key frame to the users. We follow the basic idea of Color Indexing to compare the similarity of two video frames. In this module, key frames are extracted and stored as segmented frames.

4.4 VIDEO FRAMES CLASSIFICATION:

After segmentation, we can list out possible frames which are less than the total video frames. In this module, query video segmented frames are matched with reference segmented video frames. Similarity values are calculated based on both frames. These values are calculated based on color, shape and texture values of each frame.

4.5 FORGERY PREDICTION:

If the similarity values are not same means, video should be considered as forgery videos. Otherwise, consider as original values. If it is forgery means, predict the forgery frames from query videos.

V.EXPERIMENTAL RESULTS

The proposed work can be implemented as Video forgery detection framework using C#.NET as front end and SQL SERVER as back end. Based on proposed algorithm we can detect the forgery pixels in uploaded videos. The experimental results are shown in following figures.

Fig 4: Frames conversion

User can upload the videos and represented as reference frames and query frames. And implement the video file reader to convert the frames at every 0.5 seconds.

Fig 5: Features extraction in reference frames

In this frame, extract the feature points using SIFT points. Scalar features are extracted and pointed into frames.
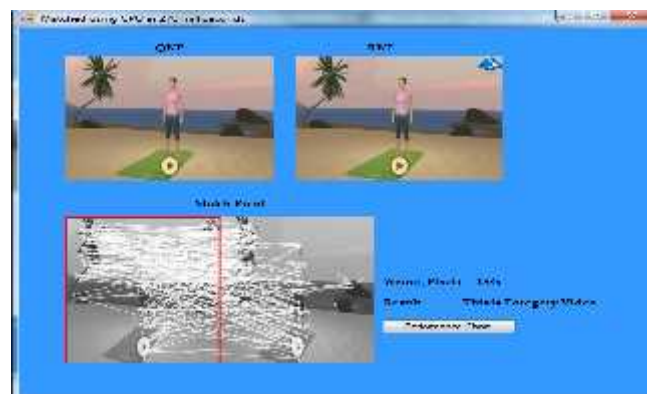
Fig 6: Features Matching (Forgery Video)

This screen describes the features as key points and Match with query and reference frames. Finally get the wrong pixels with percentage analysis.
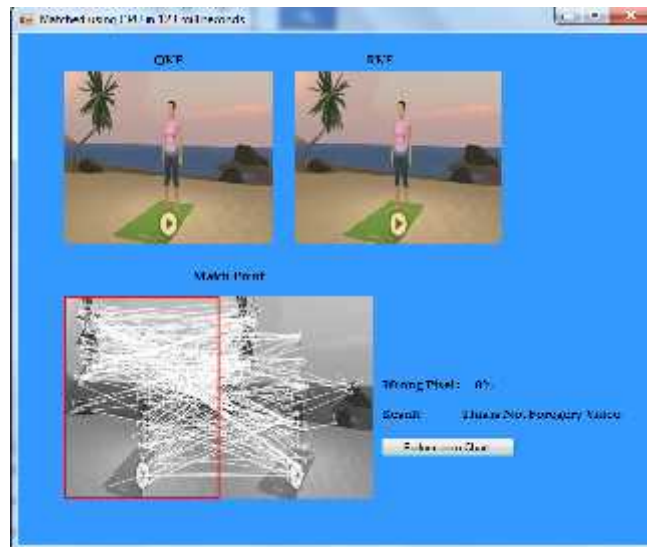
Fig 7: Features Matching (Original Video)

In this screen, display the features matching for original videos and the similarity matching can be implemented with every key point. The screen display the original videos.
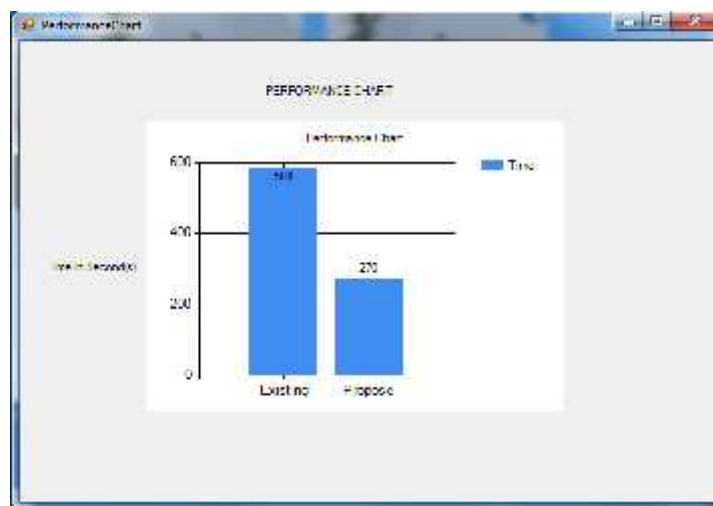
Fig 8: Performance chart

The performance of the system can be evaluated in terms of time. The proposed framework analyzes the forgery frames with limited seconds than the existing framework.

V. CONCLUSION

Digital video forensics aims at validating the authenticity of videos by recovering information about their history. Copy paste forgery, wherein a region from a video is replaced with another region from the same video (with possible transformations). Because the copied part come from the same video, its important properties, such as noise, color palette and texture, will be compatible with the rest of the video and thus will be more difficult to istinguish and detect these parts. The goal of video copy detection is to develop automated video analysis procedure to identify the original and modified copies of a video among the large amount of video data for the purposes of copyright control, monitoring and structuring

large video databases. Digital video forensics is a brand new research field which aims at validating the authenticity of videos by recovering information about their history. The fundamental problems which research found in the literature can be categorized into the natural, forgery detection, flow mapping, and source identification. Therefore, the originality and authenticity of videos or data in many cases become challenging problem. In this dissertation, we propose several new digital forensic techniques to detect evidence of editing in digital multimedia content. We use segmentation based forgery detection for forensic tasks such as identifying cut-and-paste forgeries from JPEG compressed videos and SIFT. This SIFT based technique is dependent on feature extraction by using key point detection. This strategy is for the most part used to Location of vindictive control with computerized recordings (advanced frauds) if there should arise an occurrence of duplicate move assault. The proposed work has been discovered viable result as correlation with leaving model.

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A Lightweight Encryption Algorithm For Secure Iot Based On Cryptography

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Abstract -The data and image encryption system for security improvement and delay minimization is presented. An efficient image–encryption scheme based on AES system and 2D compressive sensing is proposed.The proposed hybrid encryption scheme is built using a combination of Advanced Encryption Standard (AES). The proposed model starts by encrypting the secret data; then it hides the result in a cover image using 2D-DWT. Both color and gray-scale images are used as cover images to conceal different text sizes.The Internet of Things (IoT) being a promising technology of the future is expected to connect billions of devices.Simulations result shows the algorithm provides substantial security in just five encryption rounds. The hardware implementation of the algorithm is done on a low cost 8-bit micro-controller and the results of code size, memory utilization and encryption/decryption execution cycles are compared with benchmark encryption algorithms.
Keywords – 2D Compressive, Internet.

I. INTRODUCTION

Internet of Thing is the emerging technology in the field of Computer Engineeringespecially in networking field. Where networking may consist of the internal or external network.The Internet is the backbone of the IOT. And IOT is the technology where electrical, mechanical objects may be connected to the internet to control them remotely from anywhere of the world.Useful data and information will be swapped by billions of devices and services and these services and devices will be powered by Internet of Things.As IOT systems will be ubiquitous and pervasive, a number of security and privacy issues will arise. And the things which are connected to the internet may have many security concerns. Due to security and privacy related concerns, IOT could not set himself as a reliable technology.
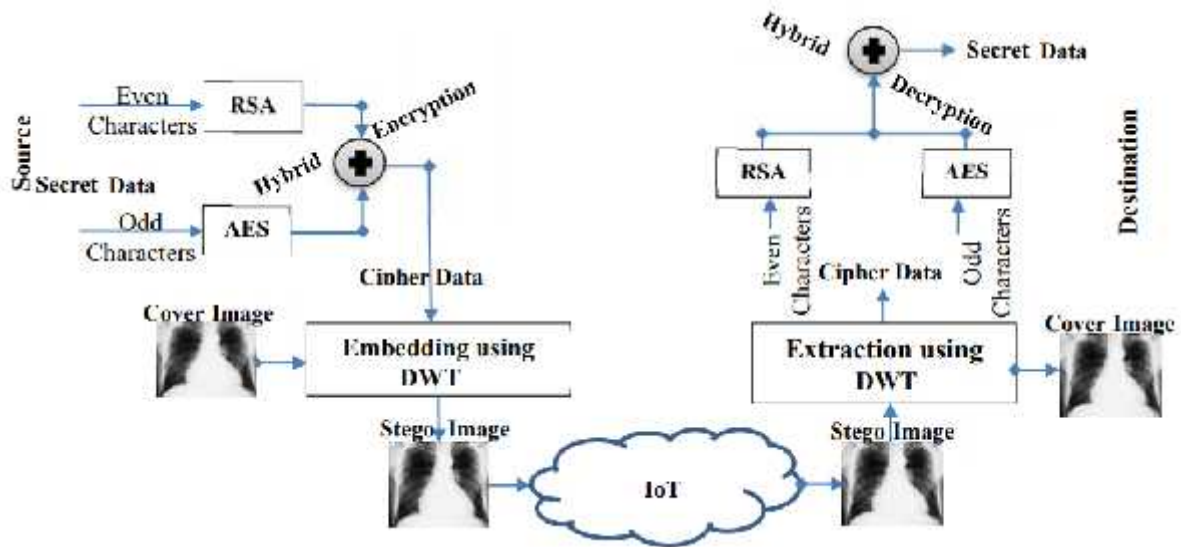
Fig.1. System Architecture

II. ALGORITHM

For each round of AES,128 bit input data and 128 bit key is required, i.e.., it needs 4 words of key in one round. Thus the input key must be expanded to the required number of words depending upon the number of rounds. The output of each round serves as input to the next stage. In AES system, same secret key is used for both encryption and decryption; thus simplifies the design.

2.1 SubBytes transformation:

SubBytes transformationis a nonlinear byte substitution that operates independently on each byte of the state using a substitution table (the SBox).

2.2ShiftRows transformation:

ShiftRows transformationis a circular shifting operation on the rows of the state with different numbers of bytes (offsets).

2.3MixColumns transformation:

MixColumns transformation is equivalent to a matrix multiplication of columns of the states. It should be noted that the bytes are treated as polynomials rather than numbers.
.
2.4AddRoundKey transformation:

AddRoundKey transformationis an XOR operation that adds a round key to the state in each iteration, where the round keys are generated during the key expansion.

III. MODULES DESCRIPTION

There are five modules using in this project,

3.1 Image As Input Module

To process an image, first select the image as input in 2*2 pixel blocks. This allows flexibility in tracking the edges and also achieves low computational complexity. Watermarking is a technology for embedding various types of information in digital content. In general, information for protecting copyrights and proving the validity of data is embedded as a watermark. Watermarked content can prove its origin, thereby protecting the data. Embedding digital signature into the selected image is processed in this module.

3.2 Swap Embedding Module

Swap the image by flipping an edge pixel into the binary image, and it is equivalent to shifting the edge location horizontally one pixel and vertically one pixel. A horizontal edge exists if there is a transition between two neighboring pixels vertically and a vertical edge exists if there is a transition between two neighboring pixels horizontally.

3.3 Authenticator Watermark Module

For providing high security, encrypt the embedded image. The purpose of authenticator watermark of a block is invariant in the watermark embedding process, hence the watermark can be extracted without referring to the original image. The encryption and decryption technique is used in this module.

3.4 Image Reconstruction Module

The image reconstruction is the construction of 2D or 3D image in which the original image is reconstructed after the decryption of that image. In this module, the property of the image is preserved and it provides the exact edge surface to the image and preserves the consistency to the image.

3.5 Removal Of Signature Module

In this module, the watermark which is embedded in the image i.e., the signature embedded with the image will be removed in order to provide back the original image for the user. The removal of signature will provide the original property to the image and this process is done with highly secure.

Output Screenshot

IV. CONCLUSION

Data compression and double encryption will reduce the storage space in database. It will also provide highest level of security for sensitive data and reduce several attacks. The system will be useful for multiple domains such as authentication, diagnosis etc.

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A Smart Text to Speech Recognition for Visually Challenged People

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Abstract - **Now a day's use of mobile is broadly increased** *and every person possesses a mobile phone, in which lots of application run. Using Android mobile phones, we can help the visually challenged people by providing easy reading of text boards and printed text information in the form of audio. Reading text from printed text images and text boards is a challenging task for visually challenged persons. The proposed system extracts and recognizes text from scene images and converts that recognized text into speech. This application is very helpful and handy for visually challenged person. The novelty of this work is to convert image containing text into speech.*
Index Terms- **Android, QR code, Text reading, Text to audio conversion.**

I. INTRODUCTION

The 215 million visually impaired people worldwide, 40million are blind. Some of the developed countries like the United States, the 2008 National Health Interview Survey (NHIS) reported that an estimated 25.2 million adult Americans (over 8%) are blind or visually impaired. Recent development trends in computer vision, digital cameras, and portable computers make it feasible to assist these individuals by developing camera-based products that combine computer vision technology with other existing commercial products such OCR systems.

Accessing text documents is troublesome for visually impaired people in many situations, such as reading text on the go and accessing text in less than ideal conditions. The objective is to allow blind users to touch printed text and receive speech output in real-time. The development of such systems requires the usage of two technologies that are central to these systems, namely optical character recognition for Text Information Extraction (TIE) and Text-To-Speech (TTS) to convert this text to speech. A Text-To-Speech (TTS) synthesizer is a computer based system that should be able to read any text aloud, when it is directly introduced in the computer by an operator. It is more suitable to define Text-To-Speech or Speech-To-Text synthesis as an automatic production of speech, by 'grapheme to phoneme' transcription.

II. EXISTING SYSTEM

In Existing researchers, have attempted to ease the burden on blind people by proposing various techniques that converts text to audible sounds. Tyflos is a couple of

glasses that have cameras attached to the side, earphones and a microphone. Voice mandates can be used to command the user and direct the platform. Some commands include "move paper closer,""move paper up," "move paper up, right" from the device to the user, and "rewind paragraph," "forward paragraph," and "volume up" from the user to the device. Nonetheless, the speech user integration might not work perfectly in a noisy environment, rendering it limited to indoor use. Finger Reader is one such device, a wearable ring with a camera which is present on the front. The voice user interface might not function perfectly in a chaos surrounding; rendering is restricted to indoor need.

2.1 DISADVANTAGES

- ❖ Microcontrollers are used which costs more. The voice user interface might not function perfectly in a noisy environment, rendering it limited to indoor use
- ❖ More expensive because they use hardware.
- ❖ They are less accurate.
- ❖ They are not portable.

III. PROPOSED SYSTEM

The concept of proposed system is the idea of developing Android app reader based text reading system for visually impaired persons. The proposed work is depicted in the Figure 1. This illustrates the text reading system for visually impaired users for their self-independent. The problem stresses the high importance of visually impaired system is that self -dependency of visually impaired users. This extends the work towards the development of ease of collecting information, self-dependent. To achieve the desired result, framework combines a set of different modules, such as App reading device, TTS module and optical character recognition module. Android is an open source and Linux-based operating system targeted for mobile devices such as smart-phones and tablet computers. Applications are generally developed in Java programming language using the Android software development kit (SDK). If used correctly, the SDK, together with Eclipse (the officially supported IDE) and JDK (Java Development Kit) is capable to deliver modern software for Android devices.
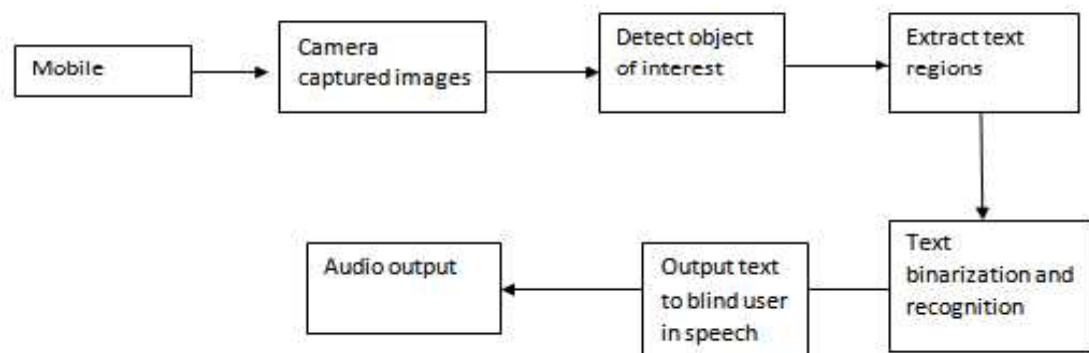
Figure 1: - Flowchart for proposed methodology

IV. EXPERIMENTAL RESULT

❖ Results are shown in following Screenshots
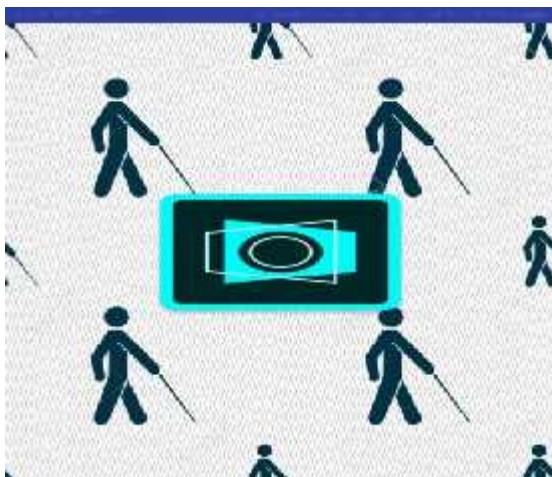
Screen shot 1

Screen shot 2

Screen shot 1: Main GUI layout

The above screen shot 1 shows main screen on mobile

Screen shot 2: Captured image from camera

The above screenshot 2 shows the captured image from camera to by android mobile phone.

The first step is capture image from camera and save the image.

| **Screen shot 3** | **Screen shot 4** |

Screen shot 3: saved image

The screen shot 3 explains the step image processing will be done for retrieve the text from image. Here the text and non text background will be separated.

Screen shot 4: Text to speech conversion

The screen shot 4 shows the text to speech conversion. In this step the text appear in text box and after that they obtained text is audible

V. CONCLUSION

A text detection and recognition with speech output system was successfully demonstrated on Android platform. This system is very handy and useful for the visually challenged persons. Compared with a PC platform, the mobile platform is portable and more convenient to use. This system will be helpful for visually challenged persons to access information in written form and in the surrounding. It is useful to understand the written text messages direction in voice form by converting it from Text to voice. It is found that this system is capable of converting the sign boards and other text into speech.

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Survey Paper On Internet Of Things, Protocols And Its Layers Overview

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Abstract -The main aim of this paper is to discuss the Internet of Things in wider and elaborate on protocols, technologies, and applications related issues. The main concept of IoT is the integration of different technologies (or) sources. IoT is a connection to a physical, vehicle and home appliances are embedded with software, hardware, sensors, and actuators these things are interconnected and exchange of data. IoT is an application domain that integrates with different technological and various sources. For example, weather monitoring node can describe its monitoring capabilities to another and connected node so that can communicate and exchange data. IoT devices may have the capabilities to adapt to the changing contexts and take actions based on their operating conditions, user context. IoT devices allowing a large number of devices to work together to produce certain functionalities. IoT interfaces allow a user to query the device, monitor their status and control them regularly and remotely. IoT devices may have several interfaces for connections to other devices both wire (or) wireless.
Index Terms: Internet of Things, Layers, Protocols, Applications of IoT

I   INTRODUCTION

IoT is combined with two keywords, the first word is "Internet" and the second word is "Things". The internet is a global system of international computer networks that use IP protocols to provide thousands of users worldwide. It composed of millions of private, public, education, government-linked by a wide range of electronic, wireless and network technologies. Today more than 100 countries are interconnected and exchange of data, opinions, news via the internet.

An IoT device is mainly used to transfer (or) exchange of data between connected devices. IoT devices allowing a large number of devices to work together to produce certain functionalities. For example, the surveillance system is adapting itself based on the context and changing dynamic conditions. IoT devices can handle unique identities and can perform remote sensing, actuating and monitoring capabilities. IoT device is mainly used to collect the data and collected data are sent to a centralized server (or) cloud-based applications back end for processing data (or) perform some tasks locally and other tasks within the IoT devices based on the temporal and space constraints (i.e.) Memory, processing capabilities, speeds, deadlines, communication latencies. IoT devices can collect the various types of data from on board (or) attached sensors such as temperature, humidity, and light intensity. IoT devices

may consist of several interfaces for connections to other devices either wire (or) wireless. IoT devices support integrated into an information network that means communicate and exchange data with other devices and system. IoT device is dynamically discovered in the network by other devices (or) Network (or) user applications.

These include
- I/O interfaces for sensors
- Interfaces for internet connectivity
- Memory and storage interface
- Audio/Video interface.

1.1 IOT Architecture
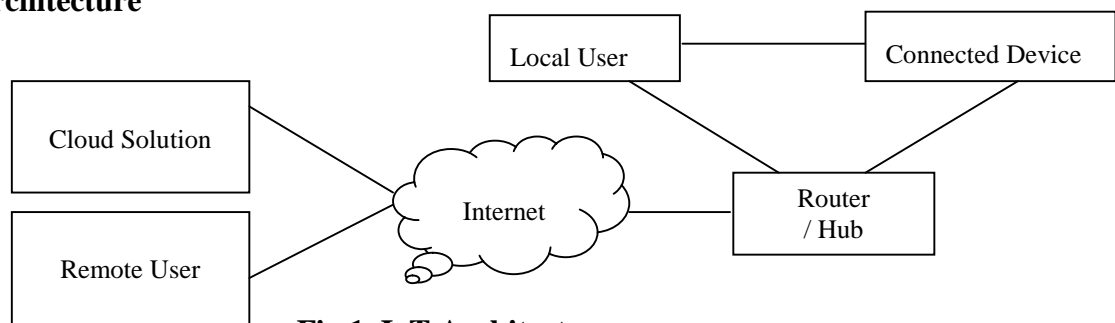
Fig.1. IoT Architecture

Fig.1. Refers cloud is stored collected data such audio, video and sensors. Remote user is mainly used to control the data and information. Local user request the service to the internet and cloud provide the service to the client.

IoT elements:
- **Sensing:** The first step in IoT is gathering information. This captured information like biometric, biological, audio and video.
- **Communication:** Transmitting data at the device level to a cloud-based service for processing. Wi-Fi requires wireless LAN based communication (or) WAN communications.
- **Cloud-Based Capture:** Gathered data is transmitted to cloud-based service and cloud-based data to provide useful information for the customer.
- **Information Delivery:** Delivery of useful information to the end user.
- **Semantics:** IoT refers to the ability to extract knowledge by different sources to provide the required services.

1.1 **Functional Blocks of IoT**
- **Identification:** To provide status information of objects and it's surrounding.
- **Sensing:** Transducer that converts physical properties such as temperature into an electrical signal that is analog to digital signals
- **Actuation:** Transducer that converts an electrical signal into physical properties that are converted into a digital signal to analog electrical signals
- **Communication:** Communicate with the IoT system.
- **Management:** Various functions to govern the IoT system.

II APPLICATIONS OF IoT

2.1 Home Automation
(i) Smart lighting: Smart lighting for homes helps in saving energy by adapting the lighting to the conditions and switching on/off (or) dimming the light when needed. Smart lighting includes solid state lighting and IP enabled lights

(ii) Smart Appliances: Modern home has a number of appliances such as TV, Refrigerators, Music system and washer/Dryer. IoT is used to managing and controlling these appliances having its own controls and remote controls.

2.2 Cities
(i) Smart Parking: In smart parking sensors are used for parking slot to detect whether the slot is empty or occupied. The information is aggregated by a local controller and then sends over the internet to the DB.

(ii) Smart lighting: Smart lighting system for roads, parks, and building can help in saving energy. A smart light builds to the internet can be controlled remotely to configure lighting schedules and lighting intensity.

(iii) Smart road: Smart roads equipped with a sensor can provide information about driving conditions, Travel time estimates, and alerts in case of poor driving conditions and accidents. Such information can help in making the road safer and reducing traffic jams.

2.3 Environment
(i) Weather monitoring: Weather monitoring system can collect the data from a sensor attached (temperature, humidity, and pressure) and send the data to cloud-based applications.

(ii) Air pollution monitoring: IoT system can monitor emission of harmful gases [CO_2, CO, NO, NO_2 etc] by factories and automobiles using gaseous and metrological sensors. The collected data can be analyzed to make informed decisions on pollution control approaches.

(iii) Forest fire detection: Forest fire can cause damage to natural resources, property and human life. The different causes of forest fires including lighting, human negligence, volcanic eruptions. IoT based forest fire detection system uses a number of monitoring nodes in different locations in a forest.

2.4 Energy
(i) Smart Grid: Grid collects and analyzes data captured in near real-time power consumption, transmission, and distribution. It provides information and recommendations to utilities, suppliers, and customers how to manage power. A smart grid uses high speed, fully integrated and two-way communication.

(ii) Renewable energy systems: Solar and Wind integrating them into the grid can cause grid stability and reliability problems.

2.5 Retail
(i) Inventory management: IoT system using RFID tags can help in inventory management and maintaining the inventory levels.

(ii) Smart Payments: NFC – Set of standards for Smartphone and other devices to communicate with each other. A customer can store the credit card information in their NFC enabled phones and make payments.

2.6 Logistics
(i) Route generation and scheduling
- It provides new services and stakeholders
- It provides advanced route guidance.

- Customer demand pickup and delivery problem.

(ii) Shipment Monitoring: It is a solution for transportation system allows monitoring the conditions inside containers. IoT based shipment monitoring system use sensor such as temperature, pressure, humidity. To monitor the container conditions and send the data to the cloud.

2.7 Agriculture

(i) Smart irrigation: Smart irrigation system uses IoT devices with soil moisture sensors to determine the amount of moisture in the soil and the release flow of water.

(ii) Green House Control: Structure with glass (or) plastic roofs that provide a conductive environment for the growth of plants. A Greenhouse can be monitored and controlled to provide the best conditions for the growth of plants. The temperature, humidity, soil moisture, light and carbon dioxide levels are monitored.

2.8 Health and lifestyle

(i) Health and fitness monitoring: Monitoring of physiological can help in continuous health and fitness monitoring. Commonly used body sensors include

- Body temperature
- Heart rate
- Blood Pressure
- ECG
- EEG

III IOT PROTOCOLS

3.1 TCP (Transmission Control Protocol)

It is a full duplex communication and connection-oriented protocols. TCP provides sending and receiving an amount of data as one big stream of byte data 64 KB. TCP breaking up the data stream into separate IP packets. Packets are numbered and reassembled on arrival, sequence, and sequence acknowledgement numbers.TCP also improves the capabilities of IP port numbers.

3.2 IP (Internet Protocol)

IP provides two main functionalities:
(i) Decomposition of the initial information flow into packets of standardized size and reassembled at the destination.
(ii) Routing of packets through the successive network from source to destination.
(iii) It is a connectionless so transmitted packets are not guaranteed to be delivered
(iv) Does not make any error detection.

3.3 HTML (Hyper Text Markup Language)

HTML is the building block for web pages and it is a format tells a computer how to display a web page.
(i) An HTML file is a text file and it contains small markup tags. These tags are mainly used to say the web browser how to display the page.
(ii) An HTML file must have an HTM (or) HTML file extension.

3.4 HTTP (Hyper Text Transfer Protocol)

It is mainly used to transfer hypertext documents that make the World Wide Web possible. A standard web address such as Yahoo.com is called a URL and here prefix HTTP indicates its protocol.

IV IOT TECHNOLOGIES

4.1 RFID (Radio Frequency Identification)

Identify the system or person wirelessly using radio waves in the form of serial numbers and solving identification issues of an object.

There are three types of RFID:
(i) Active RFID
(ii) Passive RFID
(iii)Semi-Passive RFID.

4.2 IP (Internet Protocol)

Internet protocol is a primary protocol for networking. There are 2 types of IP used such as IPV4 and IPV6.

IPV4	IPV6
32-bit length	128-bit length
Its address is binary numbers represented in decimals	Its address is binary numbers represented in Hexa decimals
Checksum, Option fields are available	Checksum, Option fields are not available

4.3 EPC (Electronic Product Code)

EPC is a 64 or 98- bit code electronically recorded on an RFID tag.

4.4 Barcode

A barcode is a square or rectangular image consisting of a series of parallel black lines and white lines spaces of varying width.

Barcode is mainly used for identifying products easily. There are 2 types of Barcodes are available

1-Dimensional - It is mainly used to store the text information such as product size, type, and color

2- Dimensional – It is mainly used to store the text information such as product price, quantity, and images.

4.5 Wi-fi (Wireless Fidelity)

Wi-fi is a network technology that allows a computer, phone, and other devices to communicate over a wireless signal. Pervasive Wi-fi delivers high-speed local area network connectivity to homes, public locations such as railway stations, hotels, and airport.

V.CONCLUSION

Today Internet of Things is being presented everywhere like smart city, Smart environment, Smart agriculture, Business Process, Security, Home appliances and Healthcare. After doing the literature survey some issues are identified, like interrupted connection among devices effecting communication. In this paper, we presented the technologies and its specification that can be used to make IoT a reality. The future is totally depends on IoT so lot of things to do at implementation level. The IoT has added a new potential into internet by enabling communications between object and human. The vision is "anywhere, anything, anyway, anytime" Communication is true sense.

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A Novel Communication Assistance System For Mute Community

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Abstract - The mute community around the globe has a hard time communicating with the rest of the world's population. This communication gap is there because a dumb person uses sign language which is not comprehensible by a normal person.This project mainly focuses on removing the barrier of communication between the mute community and the people not familiar with the concept of sign language so that the messages that a dumb person is trying to relay is understandable to a person with no knowledge of sign language. The design of the device is based on embedded systems. Flex sensors and arduino microcontroller are the key components.The system we have proposed is used as a speech recognition unit along with embedded controllers and audio pre recorder which will provide help to dumb and deaf people to express their need to the normal people.
Keywords—Flex Sensors, Arduino, Android, Bluetooth, Embedded Systems, 3 axis accelerometer

I. INTRODUCTION

In recent years, for human computer interactions hand gesture recognition is used mainly. They play an important role in gaming and control application i.e. 3- D mouse, tele-robotics & virtual reality controlling. Rather than this, it is also used in those applications which aid the physically challenged community as dumb people.

A person with speaking disability faces difficulty in communicating with the rest of the population. This device is developed to improve the lifestyle of a person who has speaking disability. This device converts the gesture to speech, text to speech,speech to text i.e, gives voice to a mute person. Speech is one of the important factor required for the humans to convey their messages. In this project, Flex sensors and arduino microcontrollers are play the major role.

II. LITERATURE SURVEY

2.1 Embedded Based Hand Talk Assisting System for Dumb People on Android Platform

In this system flex sensors play the major role in performing the gestures. Flex sensors are stitched to the glove using needle and thread. Flex sensors are bent sensitive. They give a variable resistance for a bent. Arduino microcontroller is used to convert the analog data

from the flex sensors into their digital format. The number of gestures that can be converted to speech here is limited. It is not character oriented.

2.2 AVR based embedded system for speech impaired people(Anagha j Jadhav,Mandar P Joshi)

Hand gesture recognition shown in this paper consist of dataglove, flex sensors, accelerometer, amplifier(op amp), AVR mc, playback voice module.In this, flex sensors are arranged on middle, index and thumb of the hand on a data glove and accelerometer on wrist of data gloves which used to measure wrist spin. QPR33A3 IC is used as voice playback module and zigbee of frequency 2.4Ghz is used. The drawback of this system was that the gestures were limited.

2.3 Hand gesture using Printed Circuit Assembly (Mandeep Kaur Ahuja,Amardeep Singh)

Database driven hand signal recognition scheme is used based on skin colour model method and thresholding , constructive template matching which used for human robotics application. Skin colour model is used to segment the hand area in YCbCr color space then to separate foreground and background state thresholding is used. Finally, using principal component analysis template based matching method is developed for recognition. Drawback is, it does not evaluate images with uncontrolled background and also model works only with static gestures

III. METHODOLOGY

The system has both hardware and software. Hardware part includes Flex sensors,pic microcontrollers, bluetooth module, LCD display, Android phone. Software includes the programming for android phone application and sketch for arduino microcontrollers .The proposed system is divided into 3 parts

1.Gesture to speech module
2.Text to voice module
3.Speech to text module

3.1.Gesture to speech module

Flex sensors for each finger will be stitched to the gloves and are connected to Arduino ATmega. Based on the bent, the analog output value increases. Arduino converts the analog signal into digital form and hence, generates distinct sensor values for the bends.

Three axis accelerometer is also used to sense the gestures. Accelerometers are devices that sense the forces of acceleration. Forces include gravity, vibrations and movement. Capacitance of the accelerometer varies as the suspended mass in accelerometer moves.

3.2.Text to voice module

The second one is Text to Voice translating module. It involves touchscreen based Text recognition using 65K Color Touchscreen TFT Display.

The process is to understand and decode the swipe Text made on the touchscreen and then to speak out this word/alphabet/numeral in a virtual human voice through an MP3 audio decoder. The user will be able to form sentences using this process quite quickly and easily.

The color display would help this process by rendering an onscreen swipe keypad layout for the user to input their Texts.

3.3 Speech to text module

The final one is Speech to Text Translating module. It involves advanced Speech Recognition feature and a color display.

The process is to recognize the words spoken by a normal person and to convert this voice input to an Text or text and to display it on the screen of the device. The device has a large storage space, a FAT-32 MicroSD memory card, in order to store all the Texts needed. The device communicates with an Android Smartphone using Bluetooth for speech recognition function.

IV. BLOCK DIAGRAM

Block diagram consist of an accelerometer, flex sensor, arduino ATMEGA 2560 , LCD Display, Bluetooth Module HC05 and Power Supply of 5v,1A

4.1 Power Supply

The power supply of 5V,1A is required for the Arduino ATMEGA 2560 and the Flex Sensors. The Power Supply from the mains is 230V,5A so, the power is reduced to 5v by using filters, regulators, capacitors,Transformer and a bridge rectifier.

4.2Flex Sensors

Flex sensors are stitched to a glove. The dumb person usually uses his or her hands to show signs for communicating. The resistance of the flex sensors increases as the bend increase. So, when the gesture is performed, based on the value of the sensor output is obtained.
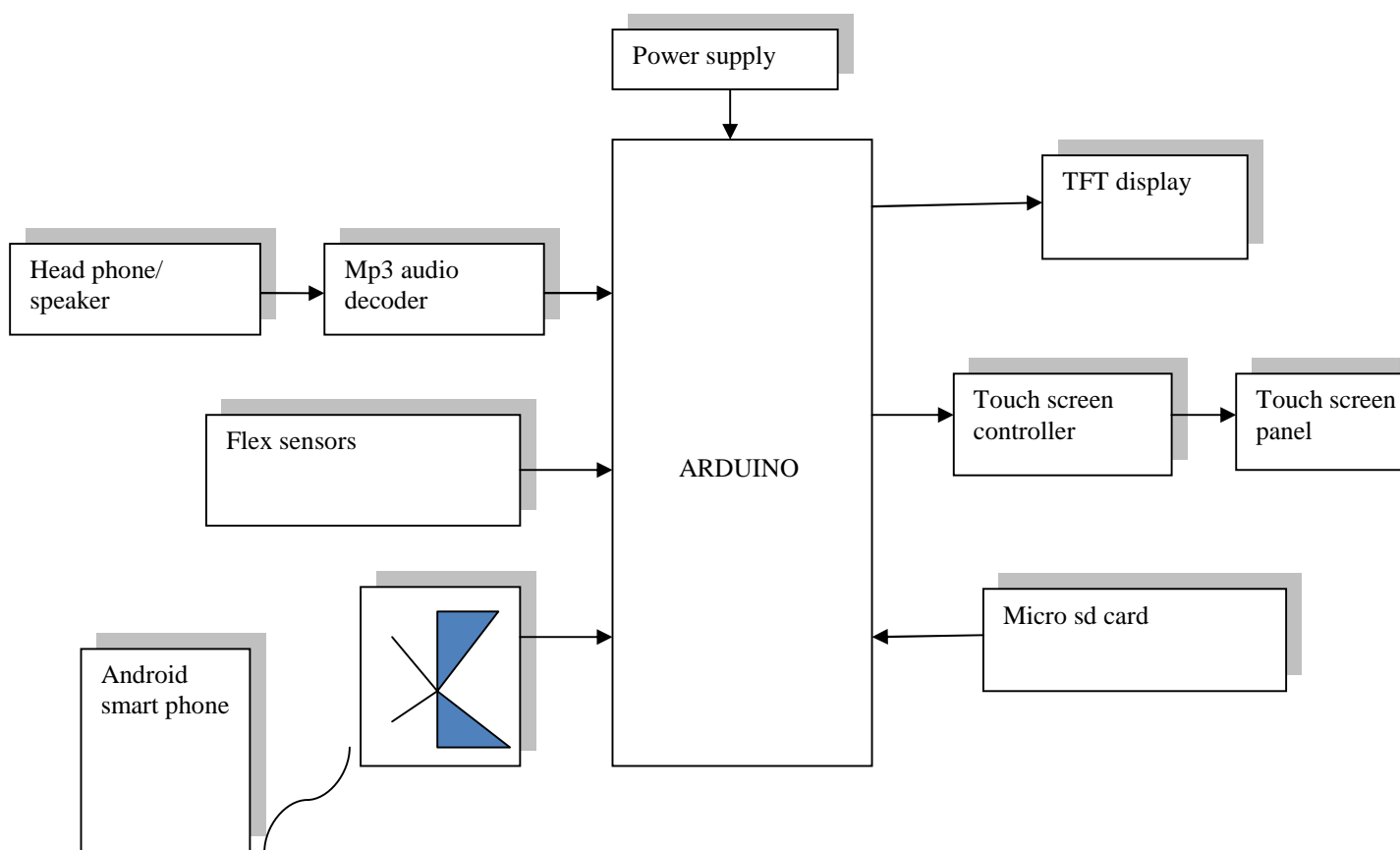

Fig. 1.   Block Diagram

4.3 axis accelerometer

It is an instrument for measuring the acceleration of a moving or vibrating body. It gives different values for acceleration in any of the three axis directions. Accelerometer is fixed on the wrist to detect the acceleration when the wrist is rotated in any of the 3 axis, X axis, Y axis and Z axis.

4.4 Arduino ATMEGA 2560

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital I/O pins, 16 analog inputs, 4 UARTs, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.The analog input from flex sensor is given to arduino to convert it into a digital form.

4.5 LCD Display

The 16×2 LCD display is a very commonly used in DIYs and circuits. The 16×2 display is used to show 16 characters per line in 2 such lines. It is used to display the output from the arduino. Android Phone This gives the speech output from the arduino. MIT app inventor is used to make an app that gives the speech output.

4.6 Bluetooth Module HC05

Bluetooth is a wireless technology standard for exchanging data over distances approximately 10 meters. HC-05 module is an easy to use Bluetooth Serial Port Protocol module. They use short-wavelength radio waves of frequency 2.4 GHz. This is used to send data from the arduino to the Android Phone.

V. CONCLUSION

The lifestyle of the mute can also be improved by providing them a means to have a voice for communication even without having a voice. Overall System is effective and efficient because of the use of Arduino microcontroller and android phone and android applications.

The future work is described as follows:

The range can be increased.

By introducing different languages flexibility is obtained.

A total of ten flex sensors can be used to increase the precision of this system.

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Securing Medical Image Using 2-D Chaotic Map and C-MLCA.

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Abstract -The progressive development in telecommunication and networking technologies have led to the increased popularity of telemedicine usage.It involves storage and transfer of medical images and related information so security concern is emerged.This project presents a method to provide the security to the medical images since its play a major role in people healthcare organizations by using Two D chaotic map and C-MLCA.The main idea in this work based on the chaotic sequence in order to provide efficient encryption method.It allows reconstructing the original image from the encrypted image with high quality and minimum distortion in its content and doesn't effect in human treatment and diagnosing.
IndexTerms—Two Dimensional chaotic map,C-MLCA

I.INTRODUCTION

To develop an application for secure transfer of medical image using chaotic encryption and C-MLCA.Internet based communications are evolving at a tremendous rate. Encryption and compression of data has become an important way to protect data resources especially on the Internet, intranets and extranets. Encryption then compression involves applying special mathematical algorithms and keys to transform digital data into code before they are transmitted and decryption involves the application of mathematical algorithms and keys to get back the original data from code. The goal of security management is to provide authentication of users, and integrity, accuracy and safety of data resources. The model for encryption and compression of an image is designed with the objectives to have confidentiality and security in transmission of the image.Used data as well as storage in the data warehouse, with the help of suitable user-defined key.

II.LITERATURE SURVEY

In this paper, an efficient chaotic encryption scheme is proposed forgray scale medical images using Arnold cat map and pseudorandomly enhanced chaotic map. The scheme achieves secure encryption by Arnold transformation followed by pixel value modification with chaotic key sequence [1].In this project, to image encryption method which uses NC (Non-linear Cycle) and 2D CAT (Two Dimensional Cellular Automata Transform) in sequence to encrypt medical images. NC to generate a pseudo noise sequence equal to the

size of the original image. We then conduct an XOR operation of the generated sequence with the original image to conduct level 1 NC encryption and then it multiplied with 2D chaotic map [2].In this paper, we obtained the state-transition diagram of complemented CA derived from a TPMACA C such that the complement vector is acyclic state lying on some nonzero tree of C.Also we analyzed the behavior of the nonlinear CA corresponding to C by using a TPMACA C [3].The two-dimensional chaotic cat map is generalized to 3D for designing a real-time secure symmetric encryption scheme. This new scheme employs the 3D cat map to shuffle the positions of image pixels and uses another chaotic map to confuse the relationship between the cipher-image and the plain-image, thereby increasing the resistance attacks [4].

III.RELATIVE WORKS

A plain image is shuffled by using Arnold cat map based bit-level permutation technique.Pixel values are modified sequentially with the help of pseudorandom key stream elements produced by chaotic logistic map.The shuffled bit planes will be combined together and the permutated version of the plain image is produced. Plain pixels will be modified one by one in the substitution phase then it produces cipher text.By doing inverse of encryption, original plain image is obtained at receiving end.

IV. PROPOSED SYSTEM

In proposed system medical image is taken as an input then, Two-Dimensional chaotic map deforms the image by shearing and then rearranges which produce newly generated medical images.C-MLCA (Cellular -Maximum Length Cellular Automata)in which it produce a noise sequence then it multiplied with generated medical images. Encrypted images are compressed byusing SPIHT and Huffman coding .At the receiving end decompression and decryption is done in reverse order

4.1 TWO DIMANSIONAL CHAOTIC MAP

Among all kinds of image encryption algorithms, chaos based encryption is one of the most widely used technologies. This is because a chaotic system has the properties of unpredictability and initial conditions sensitivity. It can generate non-overlapping and unpredictable chaotic sequences. These properties can be found similar in image encryption. For a good image encryption algorithm, its encrypted image should be very sensitive with the original image and pixels in the encrypted image should distribute randomly. In the chaos-based image encryption algorithms, the security performance of the encryption algorithms are much depended on the chaos performance of the used chaotic systems. If the used chaotic systems' chaos performance is poor, the corresponding image encryption algorithms can be broken. Therefore, developing new chaotic maps with complex chaotic behaviors and using them to design new image encryption become significant. In this project, a new two-dimensional chaotic map is proposed. It is generated by cascading the Logistic map with the Tent map, and then extending the outputs from one-dimensional (1D) to 2D. Its trajectory and information entropy analysis have demonstrated that the proposed algorithm has complex chaotic behaviors. Using the proposed 2D CM, a new image encryption algorithm is also proposed.

4.2 C-MLCA (Complemented maximum length cellular automata (C-MLCA)

C-MLCA uses a maximum length PN sequence based on the properties of CA. The sequences with unpredictably complex rules create a basis image and the basis image is

XOR-computed with the original image. That is, C-MLCA encrypts the image by changing the Eigen-values of the pixels through the computation process. Cellular automata (CA) compose a dynamical system in which space and time are discrete. The linear maximum length CA (MLCA) [19-21] is *n*-bit CA, which can generate sequences having a period of 2*n*-1. MLCA is introduced into encrypting images because it has the following advantages:
(i) Error-free encrypting and decrypting interactions.
(ii) The number of CA evolution rules is very large. Hence, the key space is extremely large.
(iii) Recursive CA substitution only requires integer arithmetic (XOR) logic operations, which simplifies the computation burden. In this paper, to improve the quality and security of reconstructed 2D image, we propose a new 2D image encryption algorithm using C MLCA.Chaos maps and chaotic systems have been proved to be useful and effective for image encryption. In our project, the two-dimensional chaotic map with C MLCA is used for image encryption. The proposed method adopts the classic framework of the permutation-substitution network in encryption and thus ensures both confusion and diffusion properties for a secure cipher. The proposed method is able to encrypt an image into a random-like one from the statistical point of view and the human visual system point of view.

V. IMPLEMENTATION

A state transition matrix based on Wolfram rules.Wolfram 90 and Wolfram 150 are used to create a transition matrix.Using the transition matrix, we generate PN sequence with the maximum length and set a random initial value convert rows and columns with the set initial value and some initial conditions.We use the complemented vector (opposite to PN sequence)and XORwith MLCA which gives a result of C-MLCA. It compute the complemented vector to generate various C-MLCA sequences.Using the generated sequences, we can create three C-MLCA basis images. These basis images such as (Red,Blue,Green) are XOR with medical image basis. Using the generated sequence, we can create three C-MLCA basis images.Each of the C-MLCA basis images is XOR-computed with red frame, green frame and blue frame of the original medical image for encryption. Lastly, we perform a conversion process using a two-dimensional chaotic map for more robust encrypted image.
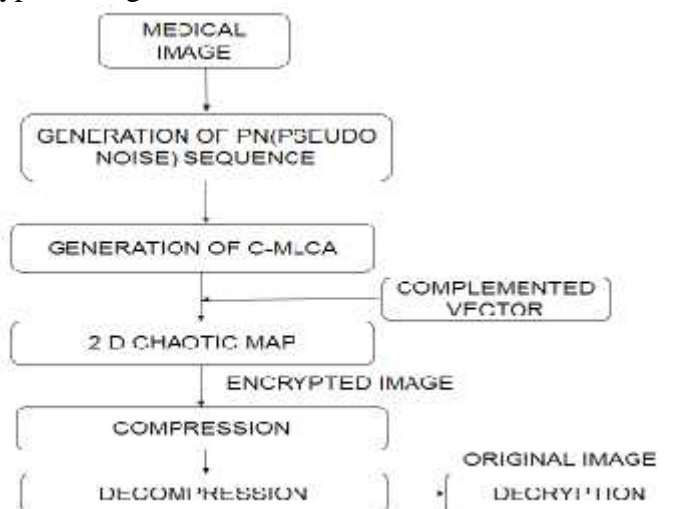
Fig.1. Flow Diagram

Encrypted image is then compressed by using Modified SPIHT Algorithm. ModifiedSPIHT (Set Partitioning InHierarchical Trees Algorithm)codes the individual bits of the image wavelet transform coefficients following a bit-plane sequence. Thus, it is capable of recovering the image perfectly (every single bit of it) by coding all bits of the transform. However, the wavelet transform yields perfect reconstruction only if its numbers are stored as infinite-precision numbers.At the receiving end the compressed image is get decompressed.Then the decompressed image is decrypted by doing encryption in reverse order.

VI .EXPERIMENTAL ANALYSIS

Fig. 2   Fig.3.

The encrypted images are represented by a histogram for Comparison with the original image, which are shown in Fig. 2 and Fig.3.

6.1.**PSNR Ratio**.
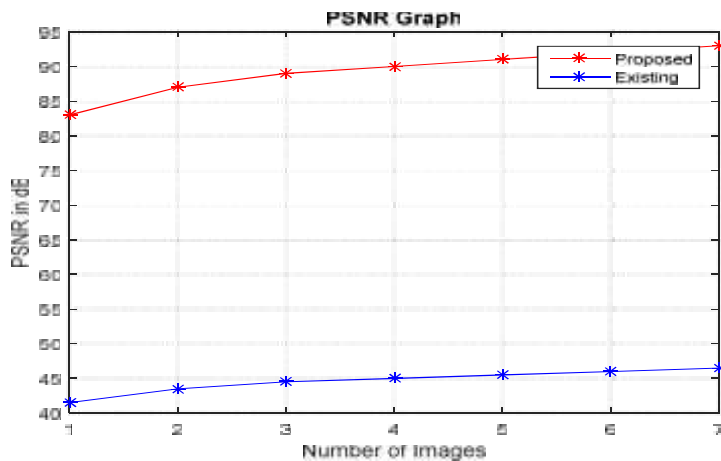
Comparison of Encrypted images and PSNR ratio.

6.2.MSE (Mean Square Error).

The **mean squared error** (**MSE**) or **mean squared deviation** (MSD) of an estimator measures the **average** of the squares of t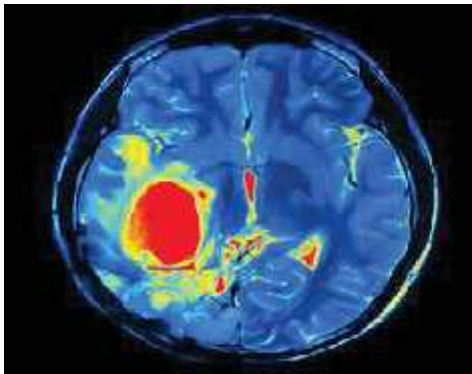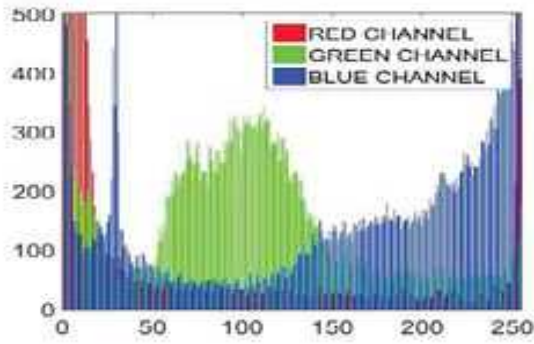he **errors**—that is, the **average squared** difference between the estimated values and what is estimated. **MSE is** nothing but your loss function. It **is** used to compare different estimators by comparing the value of **MSE** of them. Or also called as variance gives intuition of the best fit estimate.
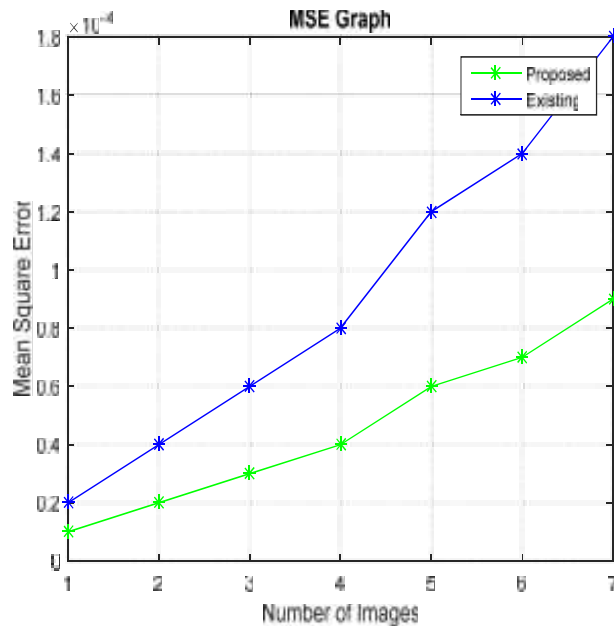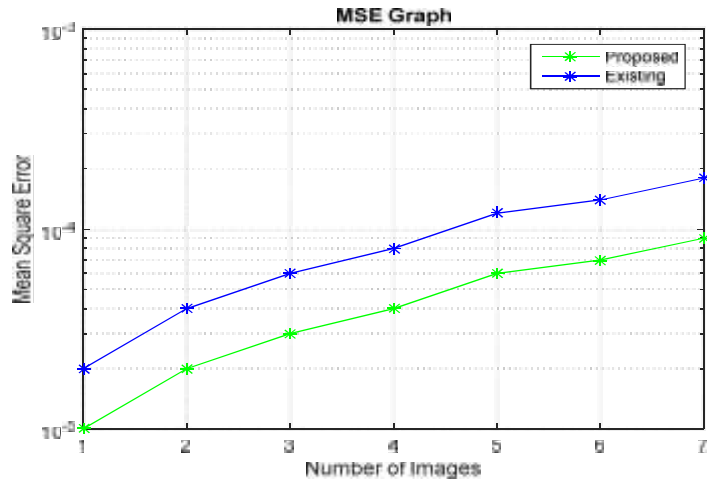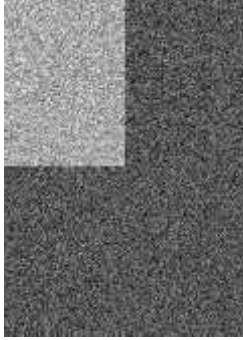
VII.CONCLUSION

In this project, we have designed an efficient image Encryption-then-Compression (ETC) system. Within the proposed framework, the image encryption has been achieved via prediction error clustering and random permutation. Highly efficient compression of the encrypted data has then been realized by a context-adaptive arithmetic coding approach. Both theoretical and experimental results have shown that reasonably high level of security has been retained. More notably, the coding efficiency of our proposed compression method on encrypted images is very close to that of the state of the-art lossless image codecs, which receive original, unencrypted images as inputs.It can be implemented by storing a medical image in a cloud and the IOT application.

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Online Double Auction System using Spectrum Allocation for PROST

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Abstract—Spectrum auction is an effective way to redistribute scarce spectrum resources. However, most spectrum auction design only target at economic robustness, while neglecting the inherent privacy leakage problem. In this paper, for the first time, we propose a Privacy-pReserving and truthful Online double auction mechanism for Spectrum allocaTion in wireless networks, PROST (Privacy-pReserving and truthful Online double auction mechanism for Spectrum allocaTion in wireless networks). Compared with the state-of-the-art solutions, PROST provides a comprehensive and strong protection for users' sensitive information, especially for location privacy and time dynamics. PROST is constructed based on our carefully-designed security building blocks, which support various arithmetics over encrypted real numbers, and they are also well applicable in other spectrum auctions. Besides, we improve on existing online spectrum auction mechanisms by designing a novel privacy-preserving buyer grouping protocol for spectrum reuse. We not only theoretically prove that PROST can realize an all-round security against semi-honest adversaries, but also extensively evaluate its performance. Experimental results validate that PROST achieves nice spectrum allocation efficiency with light computation and communication costs.
Index Terms—Spectrum allocation, online auction, privacy preservation, truthfulness.

I. INTRODUCTION

The rapid development of wireless technology is quickly exhausting the limited spectrum resources. Traditional static and rigid spectrum allocation has led to inefficient utilization of radio spectrum in both spatial and temporal dimensions. Therefore, spectrum redistribution is of great significance for improving overall utilization and mitigating the scarcity problem. Most existing works focus on single-round spectrum auctions while in reality, users often arrive dynamically in a stochastic way and may require different time-slots for spectrum occupancy, making it necessary to design online spectrum auctions.

To achieve truthfulness and improve spectrum utilization, auction mechanisms tend to stimulate bidders to bid their true valuations of the spectrum, and to disclose their geo-location information for spectrum reuse. In an online spectrum auction, bidders are further required to specify their request of timeslots to determine spectrum occupancy. However, one's true spectrum valuation, geo-location and request of time-slots are sensitive and private

information that should be shielded from the non-trustworthy auctioneer and other rival bidders. For example, bidders' true valuations of the spectrum may be commercial secrets closely related to bidder's economic situation and the profits of winning the spectrum. By leveraging historical bidding values, the auctioneer may rig the auction, and rival bidders may manipulate their bids to increase their own utility, violating the truthfulness of the original auction mechanism.

II. METHODOLOGY

Our model consists of three parties: a set of bidders including sellers and buyers, an auctioneer and an auction agent. The auction agent, who cooperates with the auctioneer to facilitate the running of privacy-preserving auction mechanism, is introduced following existing literature . The agent and the auctioneer are both semihonest, meaning that they will faithfully follow the protocol, but attempt to learn information besides the output. Before the auction starts, the agent generates the key pair of Paillier cryptosystem.

Fig. 1. ONLINE DOUBLE AUCTION FRAMEWORK FOR PROST

Then, the auctioneer cooperates with the agent to determine the winners, clearing prices and allocated time-slots based on encrypted data received from bidders, and finally returns the auction results to bidders. We consider an online double auction for homogenous spectrum. Suppose there is a set S = fs1; s2; ::::; sMg of M sellers, each of whom owns one channel to sublease during the time interval [0; T]. We assume that the channels are identical and the time is slotted (discrete).

III. RESULTS

- Bidding System

    A set of bidders including sellers and   buyers, an auctioneer and an auction agent.
- Home Page:

    This site opens up door to aspiring web users through the home page. The Home page is designed in such way that the layout is as user friendly as possible.

There is a navigational menu ad the top of the page which links to various inner page.

- Buyer

  In this module is for bidding on any selected item. The bidder /buyer has to authenticate before participating in bidding. Buyer add the bid values based on products. The Auctioneer checks whether the incremental amount entered by the bidding is equal or more than the incremental minimum set during the buyer add the bid values.

- Seller

  In this module is for bidder/seller wants to add any item in the bidding system. The bidder /seller has to authenticate before participating in bidding. Seller add the bid values based on products.

- Auctioneer

  Then, the auctioneer cooperates with the agent to determine the winners, clearing prices and allocated time-slots based on encrypted data received from bidders, and finally returns the auction results to bidders.
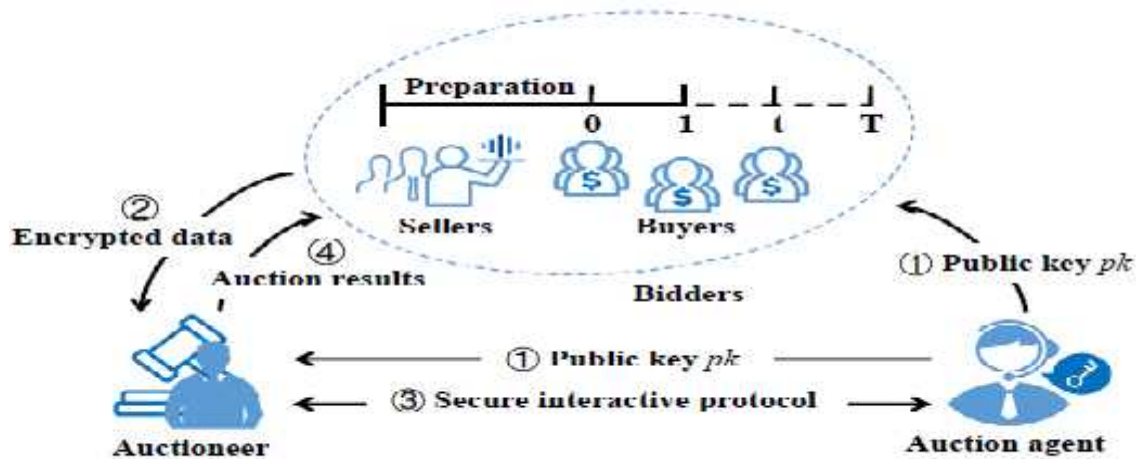
- Auction agent

  Then, the auctioneer cooperates with the agent to determine the winners, clearing prices and allocated time-slots based on encrypted data received from bidders, and finally returns the auction results to bidders.

IV. CONCLUSIONS

In this paper, we have presented PROST, the first privacy preserving and truthful online double auction mechanism for spectrum allocation. PROST provides a comprehensive privacy protection for bidders, including bid values, bid ranking order, geo-location and time dynamics. PROST is constructed based on our carefully-designed security building blocks, which are well applicable in other spectrum auctions. We have conducted rigorous security analysis to prove that PROST is secure against semi-honest adversaries. The experimental results have demonstrated that PROST achieves strong privacy protection and nice spectrum allocation efficiency with light computation and communication costs.

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Black Spot Alert on Mobile Phones of Travelers

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Abstract- Roadway traffic safety is a major concern for ordinary citizens as well as transportation governing agencies. In order to give a safe driving suggestion, careful analysis of roadway traffic data is critical to find out variables that are closely related to fatal accidents. A Black spot is a place where road traffic accidents have occurred continuously. The upcoming application will alert the user about the black spot region. Such cautioning can help in the reduction of road accidents. The person while entering into a black spot area automatically our application locate that location using the GPS of the user's mobile and alert them before they entering to that black spot region.
Keywords: Black spot, Fatal accident.

I. INTRODUCTION

Road network of a country is one of the most important factors responsible for the economic and social development of that country. India has a high population and requires a large number of transportation services like air, land and water transportation. Road network is the only means of transportation which has deep penetration in all areas and responsible for door to door service. Hence it is very important to increase and maintain the road network of our country. Road and traffic accidents are one of the important problems in India. MORTH (Ministry of Road Transport and Highways Transport Research Wing) mentioned in its report that every year there are 0.4 million accidents reported in India, which makes India a country with large accident rate. The record of different geographical regions where most of the accidents have occurred and causes death is determined the various characteristics which are related to road accidents at these locations will help to understand the different circumstances of the accident occurrence.

A "black spot" is outlined as any location that exhibits a collision potential that's considerably high when to put next with some traditional collision potential derived from a bunch of comparable location. Normally the quantity of road crashes at a specific website can vary widely from year to year, though there are not any changes in traffic or within the road layout. In statistical terms, road crashes at individual sites are rare, random, multifactor events. This means that a comparison between the numbers of road crash at a specific website should be created with reference to a set period, usually one year. Furthermore, one year knowledge is subjected to goodly applied mathematics variation. Ideally, many years knowledge square measure needed, from that a mean, annual road crash rate will be calculated.

II. EXISTING SYSTEM

In the current system, the user's want to be focus on the traffic sign boards which is placed on the black spots. In day time it will be possible but in the night the situation is out of control. Also the sign boards can be damaged by human beings or by the natural calamities. For that there is no way to caution the travelers about their traveling route.

III. LITERATURE SURVEY

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The Negative Binomial modelling technique was used to model the frequency of accident occurrence and involvement. Accident data over a period of 3 years, accounting for 1606 accidents on a principal arterial in Central Florida, were used to estimate the model. The model illustrated the significance of the Annual Average Daily Traffic (AADT), degree of horizontal curvature, lane, shoulder and median widths, urban/rural, and the section's length, on the frequency of accident occurrence. Several Negative Binomial models of the frequency of accident involvement were also developed to account for the demographic characteristics of the driver. The results showed that heavy traffic volume, spending, and narrow lane width, larger number of lanes, urban road way sections, narrow shoulder with and reduced median width increase the likelihood for accident involvement. Subsequent elasticity computations identified the relative importance of the variables included in the models. Female drivers experience more accidents then male drivers in heavy traffic volume, reduced median width, narrow lane width, and larger number of lanes. Male drivers have greater tendency to be involved in traffic accident while speeding. The models also indicated that young and older drivers experience more accidents than middle aged drivers in heavy traffic volume, and reduced shoulder and median widths. Younger drivers have a greater tendency of being involved in accidents on roadway curves and while speeding.

[2] Mohan, D. (2009). Road Accidents in India. Transport Research and Injury Prevention Program. IIT Delhi.

As in most countries, traffic police are the source of official government statistics related with road traffic injuries in India. The main sources of traffic crash data at the national level are the annual reports published by the National Crime Record Bureau (Ministry of Home Affairs) and the annual publication of the Ministry of Road Transport & Highways (MoRTH) titled Road Accidents In India. The basic information for both these reports comes from all the police stations in the country based on the cases reported to them. A brief description of the process through which statistics are compiled at the national level is as follows. When the occurrence of a traffic crash is brought to the notice of a police station (by anyone involved in the crash; anyone who knows about the crash; or a police officer who comes to know about the crash) the information reported is recorded in a First Information Report (FIR). This sets the process of 'criminal justice' in motion and the police take up investigation of the case.

IV. PROPOSED SYSTEM

With the help of the last year's accidental data, the admin will pin the black spot area in the map using the latitude and longitude of the region. And set the danger zone for a particular radius of distance. If the traveler enters into that radius, he or she will be notified with a voice alert message through the Android application which is installed on their mobile phones. If the traveler met with an accident they can able to send their location to their

contacts also to the nearest police station and the hospital. There is a two way of sending the alert message either by manual or automatic. The automatic way will be activated by using the vibration sensor.

4.1. METHODOLOGY

Formula: Haversine Formula

The Haversine formula calculates the shortest distance between 2 points on sphere exploitation their latitudes and longitudes measured along the surface. It is important for use in navigation.

The haversine can be expressed in trigonometric function as:

$$\text{Haversine ( ) = } \sin^2 (/2)$$

The haversine of the central angle (which is d/r) is calculated by the subsequent formula:

$$(d/r) = \text{haversine } (\varnothing 2 - \varnothing 1) + \cos (\varnothing 1) \cos(\varnothing 2) haversine(\lambda 2 - \lambda 1)$$

Where r is the radius of the earth (6371 km), d is the distance between two points, $\varnothing 2, \varnothing 1$ is a latitude of the two points $\lambda 2, \lambda 1$ and is longitude of the two points respectively.

Solving d by applying the inverse haversine or by exploitation the inverse sine function, we get: $\quad d = rhav^{-1}(h) = 2rsin^{-1}(\ h)$
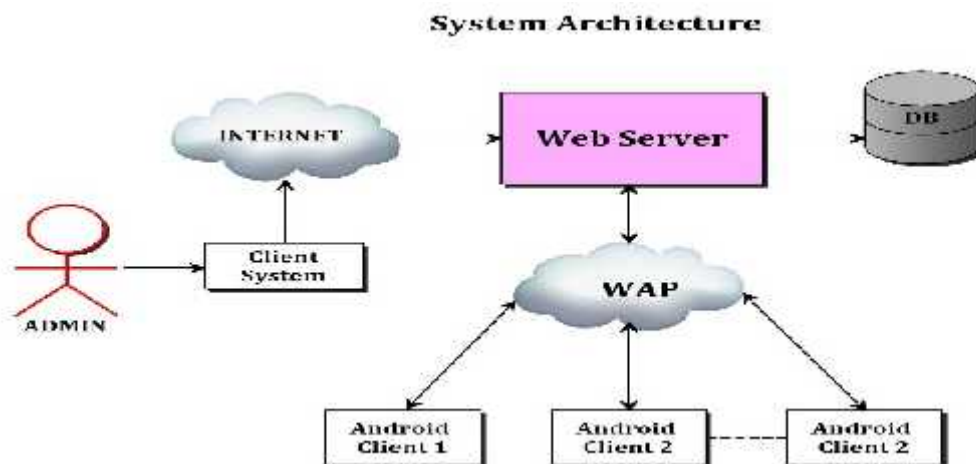

Fig. 1. Architecture Design

4.2. ADVANTAGES

- Low cost and power consumption.
- User friendly.
- Reduced amount of accidents.

4.3. MODULES

Global Positioning System:

It is a world navigation satellite system that gives geo location and time info to a GPS receiver anyplace on or close to the earth wherever there's a clear line of sight to four or more

GPS satellites. Obstacles like mountains and buildings block the comparatively weak GPS signals. The GPS doesn't need the user to transmit any data, and it operates independently of any telephonic or web reception, although these technologies will enhance the utility of the GPS positioning information. The GPS provides vital positioning capabilities to military, civil, and industrial users around the world. The U.S. government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver.

There are two modules used in this system. They are

- Admin
- User

Admin:

The admin model is used to update the black spot areas, hospital details, and police contacts. The web page is secured with the user id and the password. Only the authorized user will able modify the database. Those people will point the location with the help of the Google map API using the latitude and the longitude. Every black spot will have a separate zone id, zone name, threshold radius, and the alert message.

User:

The user wants to install the android application in their mobile and want to allow the application to access the GPS location. First, the user wants to register by providing the required details. After that, they want to login using the login credentials. The user wants to add their contacts list, to whom they want to send the alert message when they meet with an accident. When the user begins to ride the vehicle, they want to press the start button in the application, then the application will begin to locate the black spot areas. If there is any black spot in the user's location then the alert message will be sent by an application in the mean of a voice message. There is a panic button in the application if the user is met with the accident they can able to manually send their location to their contacts.

4.4. RESULTS AND DISCUSSIONS

Fig. 2. Adding Accident Zone
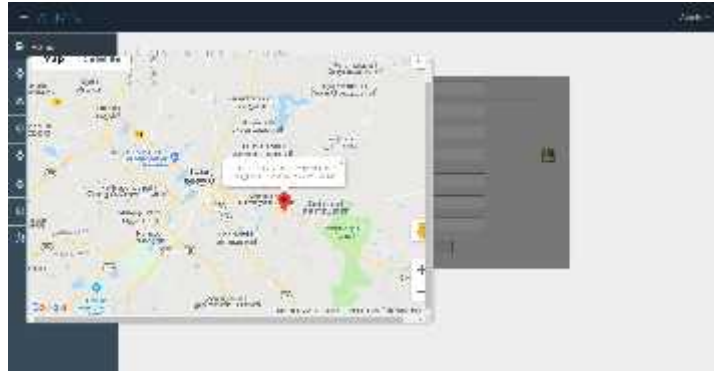
Fig. 3. Getting location

Fig. 8. Alert Window

V. CONCLUSION

Through the accomplishment of the proposed system, the system is created. It will send the alert messages to the contacts, hospital and police station as we expected. Usage of this application, it reduces the accidental counts. And also the system worked satisfactorily well to the user actions.

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Visible Light Communication for Data and Audio Transmission Based on Li-Fi

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Abstract - Light Fidelity (Li-Fi) is a data transfer technique that uses light. Light is analogous not only to illumination but also to speed. Li-fi is also much secured since light cannot pass through walls. It uses visible light portion of the electromagnetic spectrum to transmit information. Hence the visible light communication solves the problem of radio frequency congestion. In this project we transmit data and audio through light at very high data rates without use of microcontrollers and its other peripheral devices.
IndexTerms—Visible light, Secured, High Speed

1.INTRODUCTION

Light Fidelity (Li-Fi) is a bidirectional, high-speed and fully networked wireless communication technology similar to Wi-Fi. Li-Fi is the term some have used to label the fast and cheap wireless communication system, which is the optical version of Wi-Fi. Li-Fi uses visible light instead of Gigahertz radio waves for data transfer.

The term was coined by Harald Haas and is a form of visible light communication and a subset of optical wireless Communications (OWC) and could be a complement to RF communication (Wi-Fi or cellular networks), or even a replacement in contexts of data broadcasting. The light waves cannot penetrate walls which makes a much shorter range, though more secure from hacking, relaDirect line of sight is not necessary for Li-Fi to transmit a signal; light reflected off the walls can achieve 70 Mbit/s. The term Li-Fi was first used by Haas in his TED Global talk on Visible Light Communication. According to Hass, the light, which he referred to as D-Light, can be used to produce data rates higher than 10 megabits per second which is much faster than our average broadband connection.

`Li-Fi can play a major role in relieving the heavy loads which the current wireless systems face since it adds a new and unutilized bandwidth of visible light to the currently available radio waves for data transfer. The visible spectrum is the portion of the electromagnetic spectrum that is visible to the human eye. Electromagnetic radiation in this range of wavelengths is called visible light. A typical human eye will respond to wavelengths from about 390 to 700 nm. The dramatic growth in the use of LEDs (Light Emitting Diodes) for lighting provides the opportunity to incorporate Li-Fi technology into a plethora of LED environments. Li-Fi is particularly suitable for many popular internet "content consumption" applications such as video and audio downloads, live streaming, etc. These applications place

heavy demands on the downlink bandwidth, but require minimal uplink capacity. In this way, the majority of the internet traffic is off-loaded from existing RF channels, thus also extending cellular and Wi-Fi capacities.

Although Li-Fi LEDs would have to be kept on to transmit data, they could be dimmed to below human visibility while still emitting enough light to carry data. It offers much larger frequency band (300 THz) compared to that available in RF communications (300GHz). Researchers reached bit rate of 224 GB/s which is 100s of times faster than our average WI-FI connection at home or office.

II. EXISTING DATA & AUDIO COMMUNICATION USING LI-FI

2.1 DATA TRANSMISSION AND RECEPTION

Optical wireless technologies called visible light communication (VLC) are more recently referred to as LiFi, offers an entirely new paradigm in wireless technologies in terms of communication speed, flexibility and usability. LEDs (Light Emitting Diodes) are recognized in the terms of green lighting resource because they contain no hazardous materials such as mercury emitted by fluorescent lamps LED's have a unique ability that goes beyond their use as energy-efficient lighting devices. They can be switched on and off within nanoseconds, which makes them super-fast transmitters of binary data. This flickering occurs faster than the eye can see, so even LED's used for room lighting can be used to transmit data.

Transmitter   Receiver
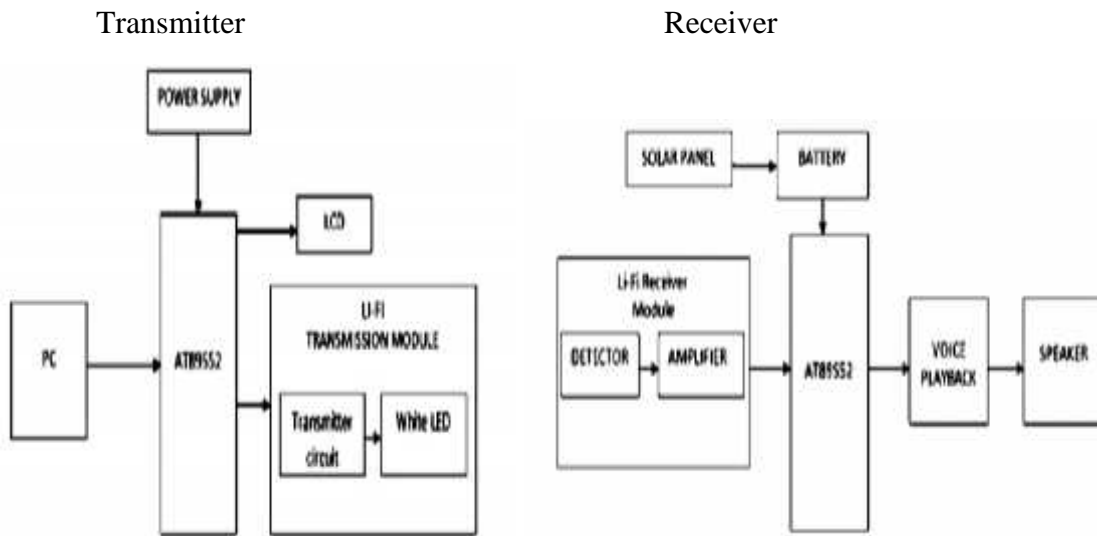
Fig.1 System Architecture

The system architecture consists of a transmit section and a receiver section. The transmit section consists of the data input which is then fed into Atmel AT89S52 and then to a transmission module consisting of transmitter circuit and LED. Based on the data, the switching control generates a stream of 1s and 0s thereby encoding the data in binary. The output of this control is given to the array of LED's which turn OFF and ON at extremely high speeds. This ON-OFF modulation of the LED light transmits the data. The receive section consists of a photodiode, e.g. silicon photo detector or an Infrared germanium cylindrical detector. The photo detector demodulates the incoming received signal based on the sequence of 1s and 0s. The demodulated signal is then sent to a filter to remove unwanted

noise. This filtered signal is then amplified using signal amplification mechanism. The filtered and amplified signal is then given to an output device such a speaker.

The input signal is thus remotely transmitted and received. Thus, a Li-Fi network is established.

TRANSMITTER   **RECEIVER**
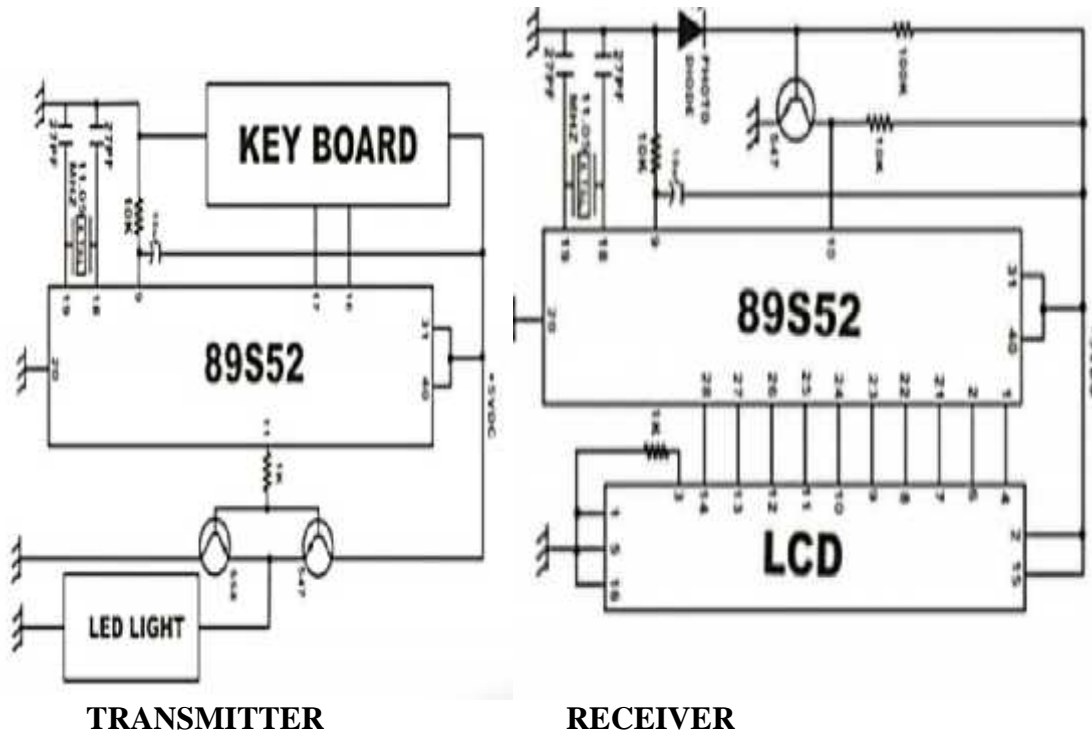
Fig. 2 Transmitter and Receiver Circuit diagram

2.2 AUDIO TRANSMISSION AND RECEPTION

Circuit in   Fig.3 consists of two parts, which are receiver and transmitter. The transmitter consists of 3 transistors and few passive components paired with 1 watt LED. Which will changes its brightness with respect to audio signal. But changes in brightness due to audio signal will not visible to human eye. We only see static illumination of white LED. The receiver consists of a photo detector (here I used solar cell) which is paired with an amplifier. The sound output is given by the speaker. The transmitter is transistorized amplifier which consists of 3 amplifiers connected in parallel to drive the 1 watt white LED. Each transistor base consists of voltage divider which gives necessary bias for the individual transistor. The input stage has capacitors at each transistor's base for blocking DC signals which could degrade the quality of output.
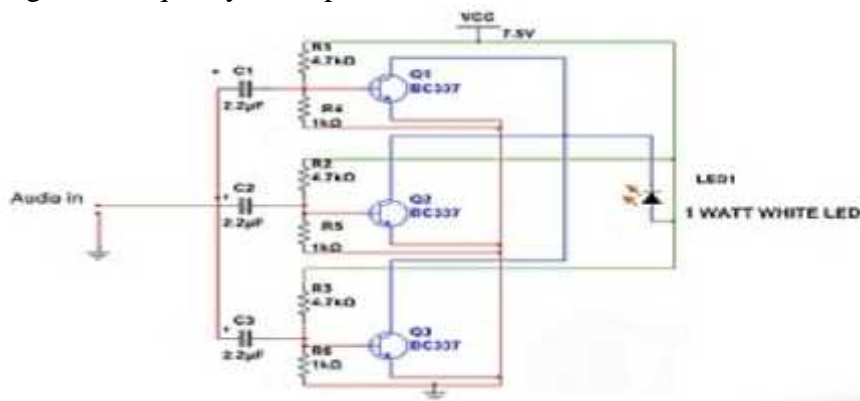
Fig.3 Audio Transmitter Circuit

The receiver consists of a 6 volt solar cell (3 volts above works fine) in series with 2.2uf capacitor which is paired with an amplifier. The amplifier need not to be the same illustrated here, but you can use any amplifier lying around your house. But make sure it as good sensitivity.

III PROPOSED METHOD

3.1 DATA TRANSMISSION AND RECEPTION

The main advantage is visible light's frequency spectrum bandwidth, which ranges from 430 THz to 750 THz. The bandwidth is much larger than the radio frequency bandwidth, which ranges from 3 kHz to 300 GHz. A new generation of high brightness light-emitting diodes forms the core part of light fidelity technology. XCTU is a multi-platform application compatible with Windows, Mac OS and Linux. Graphical Network View for simple wireless network configuration and architecture. It includes new tools that make it easy to set-up, configure and test X-Bee RF modules. The speed of data transmission in serial communication is specified by baud rates. Asynchronous data transfer is used for the serial communication which is done at a lower speed, typically at standard rates such as 2400, 4800, 9600, 19200 baud etc. Here the input data's (character/numbers) corresponding ASCII value is generated and simultaneously converted to BINARY and given to the LED .The laptop and the circuit is interfaced using a TTL to USB convertor.

The receiving terminal also comprises of similar hardware except for the photo detector to track the data sent through the light from the led system. It consists of the phototransistor as a light sensor, whose output is fed to a comparator built using low power OP-AMP The comparator circuit makes the DATA IN into binary compatible levels. Even though the amount of light falling on the phototransistor varies, the comparator ensures that it is modified to a correct binary level .The corresponding flickering to the BINARY 1s & 0s is performed continuously to form a data in the form of an array. This is done to obtain data rates in the range of hundreds of megabits per second. The LED intensity is modulated so rapidly that human eye cannot notice, so the light of the LED appears constant to humans.
The receiving section is interfaced with another laptop where the received data (from the transmitter) is seen in the X-CTU software, where the BINARY value that is converted to ASCII values and the output is displayed in the XCTU terminal of the laptop.

Most XBee's operate on the 2.4GHz 802.15.4 band, and the channel further calibrates the operating frequency within that band. You can usually leave the channel setting alone, or at least make sure every XBee you want to have on the same network operates on the same channel.

3.2 AUDIO TRANSMISSION AND RECEPTION

The analog input is given through the AUX cable. Here analog input in form of music, which is connected with the biasing circuit consisting of BC337 transistors paired with passive components and connected to the 1W LED .The transmitted signal from the LEDs has to be detected and acknowledged. So in order to detect the message signal from the blinking led light we use a solar cell which comprises large number of photocells connected in series.
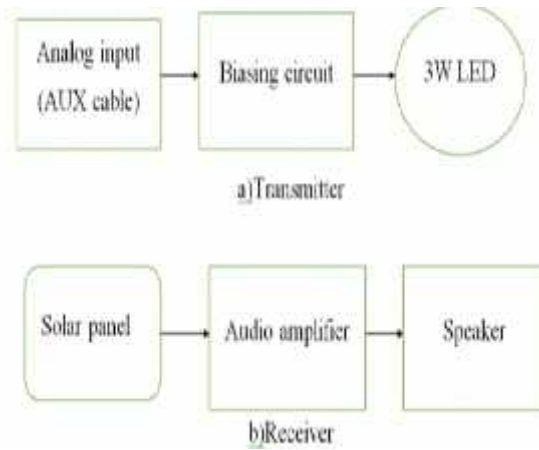
Fig. 4. Block diagram of proposed data transfer system

The solar cell detects the variation in light, since the blinking can be easily detected and output of the solar cell will be in analog form. So using solar cell we could detect and demodulate the message signal transmitted. The demodulated signal will be at low voltage range.

The output signal from the audio amplifier is given to the speaker. The speaker is interfaced with the audio amplifier. The input audio signal transmitted is obtained as Output in the speaker. In order to prove the audio output received from our experiment is same as the input audio signal, we have plotted the waveform diagrams of the corresponding input and output audio signals using MATLAB.

3.3 AUDIO TRANSMISSION RECEPTION USING LIFI

Similarly the waveforms are plotted for the input and output audio signals using MATLAB. The input analog signal from the transmitter circuit and the output signal received at the other end of the circuit is recorded and the waveforms are plotted accordingly.
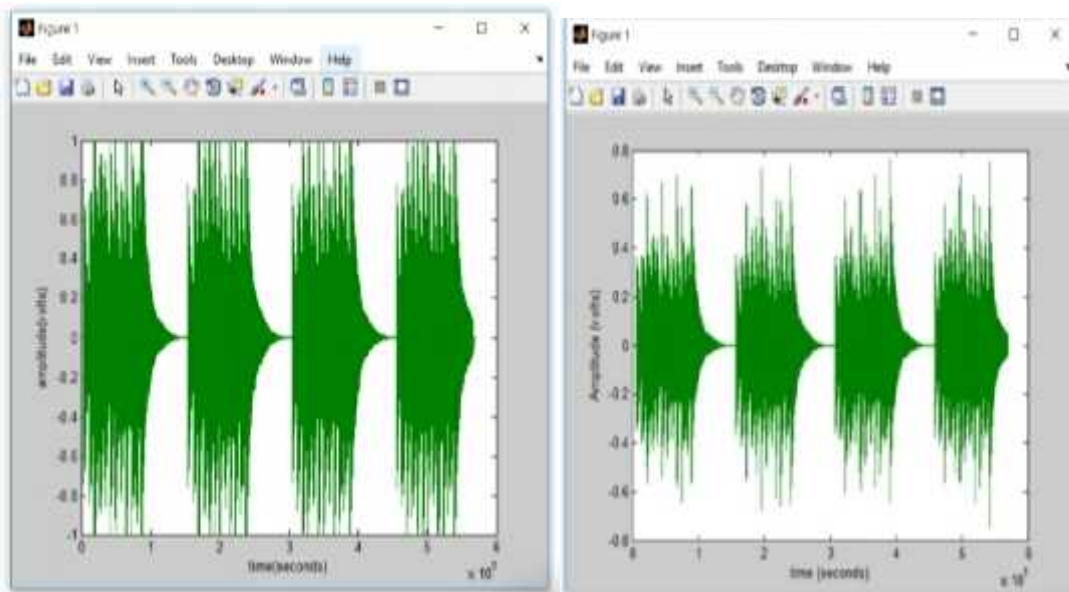
Fig.5 Transmitted and Received Audio

IV. CONCLUSION

Li-Fi is the trend of today and near future. It is one of the cheapest and efficient mode of data transfer. These methods can be used to transfer data and audio in a better way. Based on the observations and the graphical results obtained from the proposed circuitry it is a clear that the transfer of data and audio without the use of microcontrollers is much more efficient and powerful.

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Hybrid Cloud Approach For Secure Authorized Deduplication

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Abstract— Cloud computing has reached a security that leads it right into a effective phase. This approach that most of the primary issues with cloud computing was addressed to some extent that clouds have become interesting for full industrial exploitation. However, issues over information protection nonetheless save you many customers from migrating information to far off storage. Client-side data compression in particular ensures that multiple uploads of the same content only consume network bandwidth and storage space of a single upload. Compression is actively used by a number of cloud backup providers as well as various cloud services. Unfortunately, encrypted data cannot be deduplicated because they are present in pseudorandom format: as a consequence, current schemes have to entirely sacrifice either security or storage efficiency. In this system, present a scheme that permits a more fine-grained trade-off. The intuition is that outsourced data may require different levels of protection, depending on how popular it is: content shared by many users. Then present a novel idea that differentiates data according to their popularity. Propose an encryption methodology that guarantees semantic security for unpopular data and provides weaker security and better storage and bandwidth benefits for popular data. This way, data de-duplication method can be effective for encrypted data, whilst semantically secure encryption protects unpopular content. Finally, can use the backup recover system at the time of blocking and also analyze frequent login access system.

Index Terms—Duplicate Checking, File Storage, Similarity Checking Algorithm, Backup Recovery

I.INTRODUCTION

Cloud computing is a computing paradigm, in which a big pool of structures are linked in private or public networks, to offer dynamically scalable infrastructure for software, information and document storage. With the arrival of this technology, the amount of computation, software website hosting, content storage and delivery is reduced drastically. It is a practical approach to experience direct cost benefits and it has the capacity to convert a data center from a capital-intensive set up to a variable priced environment. The idea of cloud computing is based totally on a fundamental principles of reusability of IT capabilities. The difference that cloud computing brings as compared to conventional standards of "grid computing", "allotted computing", "application computing", or "autonomic computing" is to

increase horizons across organizational barriers. Forrester [1] defines the cloud computing: "A pool of abstracted, extraordinarily scalable, and controlled compute infrastructure capable of web hosting end customer applications and billed by consumption". It is a generation that uses the network and critical far off servers to maintain records and packages and lets in customers and agencies to apply packages without set up and get right of entry to their private documents at any personal computer with internet access. This technology allows for a whole lot greater green computing by using centralizing statistics storage, processing and bandwidth. The examples of cloud computing are Yahoo email, Gmail, or Hotmail.

1.1 SERVICE MODELS OF CLOUD

Cloud Providers provide services that can be combined into three categories in figure 1.2

- ✓ Software as a Service (SaaS)

- ✓ Platform as a Service (Paas)

- ✓ Infrastructure as a Service (Iaas)

1.1.**1 Software as a Service :**In this model, a whole service is offered to the user, on demand basis. A single instance of the service runs on the cloud & a couple of quit users are serviced. Customers can know there may be no need for in advance investment in servers or software program licenses, at the same time as for the issuer; the fees are reduced, because best a single utility desires to be hosted & maintained. Today SaaS is offered by way of companies including Google, Salesforce, Microsoft, Zoho, and so on.

1.1.2 Platform as a Service : Here, a layer of software, or development environment is encapsulated & supplied as a service, upon which other better ranges of service can be constructed. The customer has the liberty to build his own applications, which run on the provider‟s infrastructure. To meet manageability and scalability necessities of the packages, PaaS providers provide a predefined aggregate of OS and application servers, along with LAMP platform (Linux, Apache, MySql and PHP), restricted J2EE, Ruby and many others.

1.1.3 Infrastructure as a Service IaaS offers basic storage and computing abilities as standardized services over the network. Servers, storage structures, networking gadget, information centre area and so on. Are pooled and made available to address workloads. The client could usually installation his own software on the infrastructure. Some not unusual examples are Amazon, GoGrid, 3 Tera, and so on.

1.2 DEPLOYMENT MODELS OF CLOUD

Enterprises can select to install programs on Public, Private or Hybrid clouds. Cloud Integrators can play a crucial component in figuring out the proper cloud direction for every agency.
1.2.1 Public Cloud

Public clouds are owned and operated by using third parties; they deliver advanced economies of scale to customers, as the infrastructure costs are spread amongst a mixture of users, giving every person client an appealing low-amount, "Pay-as-you-go" version. All customers share the identical infrastructure pool with restricted configuration, safety protections, and availability variances. These are controlled and supported with the aid of the

cloud company. One of the benefits of a Public cloud is that they may be large than an companies cloud, consequently offering the ability to scale seamlessly, on demand.

1.2.2 Private Cloud

Private clouds are constructed exclusively for a single corporation. They goal to address worries on records safety and provide extra manipulate, that's normally missing in a public cloud. There are versions to a personal cloud:

- ✓ On-premise Private Cloud
- ✓ Externally hosted Private Cloud

1.2.2.1 On-premise Private Cloud

On-premise personal clouds, also called inner clouds are hosted within one's very own data center. This version affords a more standardized system and protection, but is constrained in aspects of length and scalability. IT departments could also need to incur the capital and operational fees for the physical resources. This is nice proper for applications which require complete control and configurability of the infrastructure and protection.

1.2.2.2 Externally hosted Private Cloud

This type of personal cloud is hosted externally with a cloud provider, where the company allows an one of a kind cloud surroundings with complete guarantee of privacy. This is nice perfect for firms that don't decide upon a public cloud due to sharing of physical sources.

1.2.3 Hybrid Cloud

Hybrid Clouds integrate each public and private cloud models. With a Hybrid Cloud, service vendors can utilize third party Cloud Providers in a complete or partial manner for this reason growing the ability of computing. The Hybrid cloud environment is capable of imparting on-call for, externally provisioned scale. The capability to augment a personal cloud with the sources of a public cloud can be used to manipulate any unexpected surges in workload.

II.RELATED WORK

L. Wang, et al., [1] The research contributions are threefold: first, we endorse an innovative public cloud utilization version for small-to medium scale medical groups to utilize elastic assets on a public cloud web page at the same time as retaining their flexible device controls, i.e., create, prompt, droop, resume, deactivate, and destroy their high-level management entities—carrier control layers without knowing the information of management. Second, layout and enforce an innovative machine—DawningCloud, at the core of which are light-weight carrier management layers going for walks on pinnacle of a not unusual management service framework. The not unusual control carrier framework of DawningCloud not best helps building light-weight carrier management layers for heterogeneous workloads, however also makes their control tasks easy. Third, compare the systems comprehensively the usage of both emulation and real experiments. This discovered that for two traditional clinical workloads: High-Throughput Computing (HTC) and Many-Task Computing (MTC), DawningCloud saves the aid consumption. First, with respect to Reservoir, the CSF of Dawning- Cloud enables building lightweight service management layers for heterogeneous workloads. We take a bottom-up approach to constructing DawningCloud. The not unusual sets of capabilities for one-of-a-kind runtime environment software are delegated to the CSF. CSF facilitates constructing skinny service management layers—TRE for heterogeneous workloads, and a TRE only implements core capabilities for a selected workload

R. Kienzler, et al., [3] In this paper, advise an incremental statistics get admission to and processing approach for data-extensive cloud applications that can conceal data transfer latencies whilst retaining linear scalability. Similar in spirit to pipelined question assessment in traditional database systems, facts is accessed and processed in small increments, thereby

propagating data chunks from one stage of the records evaluation venture to another as quickly as they're available as opposed to waiting till the entire dataset turns into available. This way is able to method data basically in reminiscence (hence, reduce time-eating I/O to nearby disk and cloud garage, and keep away from storage charges) as well as attaining pipelined parallelism (in addition to the present partitioned parallelism), main to a reduction in basic task finishing touch time. In our method, data is accessed in a "stream-as-you-go" fashion in preference to in whole batches, making a move-based records management architecture a good base for implementation. We have designed our "movement-as-you-cross" approach for a certain elegance of cloud packages characterised via the following. First of all, the information evaluation algorithms concerned in the utility have to be suitable for incremental processing (like simplest non-blocking operators may be evaluated in a pipelined fashion in traditional databases).

C. Olston, et al., [4] Building and updating a seek index from a circulate of crawled internet pages. Some of the several steps are compression, hyperlink evaluation for unsolicited mail and quality classification, joining with click-primarily based popularity measurements, and file inversion. Processing semi-based records feeds, e.g. Information and (micro-) blogs. Steps consist of de-duplication, geographic vicinity resolution, and named entity reputation. Processing along those strains is increasingly more performed on a new generation of flexible and scalable information control systems, such as Pig/Hadoop. Hadoop is a scalable, fault-tolerant system for walking person map-lessen processing operations over unstructured records files. Pig adds better-level, dependent abstractions for records and processing. In Pig, a language called Pig Latin is used to explain arbitrary acyclic records waft graphs constructed from styles of operations: (1) integrated relational-algebra-style operations (e.G. Clear out, be a part of); and (2) custom person-defined operations (e.G. Extract internet page hyperlinks, compute quintiles of a fixed of numbers). Despite the achievement of Pig/Hadoop, it's far becoming apparent that a new, higher, layer is wanted: a work manager that offers with a graph of interconnected Pig Latin packages, with facts surpassed among them in a non-stop fashion. Given that Pig itself offers with graphs of interconnected facts processing steps, it's miles natural to ask why one would layer every other graph abstraction on top of Pig.

K.H. Lee, et al., [5] The MapReduce is a programming model created by using Google. It becomes designed to simplify parallel statistics processing on massive clusters. First version of the MapReduce library becomes written in February 2003. The programming model is stimulated by means of the map and decreases primitives located in Lisp and different useful languages. Before growing the MapReduce framework, Google used hundreds of separate implementations to process and compute huge datasets. Most of the computations were notaly simple, but the input records were regularly very big. Hence the computations needed to be distributed throughout hundreds of computers in order to complete calculations in an inexpensive time. MapReduce is incredibly efficient and scalable, and consequently can be used to system massive datasets. When the MapReduce framework turned into introduced, Google absolutely rewrote its web seek indexing system to apply the brand new programming model. The indexing machine produces the data structures used by Google internet seek. The parallelization doesn't always need to be done over many machines in a network. There are extraordinary implementations of MapReduce for parallelizing computing in unique environments. Phoenix is an implementation of MapReduce, that is aimed at shared-memory, multi-core and multiprocessor systems, i.e. Single computer systems with many processor cores.

III.EXISTING METHODOLOGIES

Many systems have been developed to provide secure storage but traditional encryption techniques are not suitable for compression purposes. Deterministic encryption, in particular convergent encryption, is a good candidate to achieve both confidentiality and compression but it suffers from well-known weaknesses which do not ensure protection of predictable files against dictionary attacks. And also existing system makes use of proxy re-encryption, has been proposed but information on performance and overhead were not provided. Unfortunately, compression loses its effectiveness in conjunction with end-to-end encryption. End-to-quit encryption in storage is the method by means of which information is encrypted at its source prior to ingress into the storage machine. It is becoming an increasingly distinguished requirement because of both the range of safety incidents related to leakage of un-encrypted data and the tightening of region-specific rules and guidelines. Clearly, if semantically secure encryption is used, file compression is impossible, as no one apart from the owner of the decryption key can decide whether two cipher texts correspond to the same plaintext. Trivial answers, such as forcing customers to share encryption keys or the use of deterministic encryption, fall short of presenting applicable ranges of security. As a effect, storage structures are anticipated to undergo primary restructuring to hold the present day disk/client ratio within the presence of end-to-end encryption. The layout of storage performance functions in widespread and of compression functions especially that don't lose their effectiveness in presence of end-to-end safety is consequently nonetheless an open problem.

3.1 FACE CLASSIFICATION USING GRASSMANN ALGORTIHM

Storage efficiency functions such as compression and compression afford storage providers better utilization of their storage back ends and the ability to serve more customers with the same infrastructure. Data compression is the process by which a storage provider only stores a single copy of a file owned by several of its users. There are four different compression strategies, depending on whether compression happens at the client side (i.e. before the upload) or at the server side, and whether compression happens at a block level or at a file level. Compression is most rewarding when it is triggered at the client side, as it also saves upload bandwidth. For these reasons, compression is a critical enabler for a number of popular and successful storage services that offer cheap, remote storage to the broad public by performing client-side compression, thus saving both the network bandwidth and storage costs. The goal of the system is to guarantee data confidentiality without losing the advantage of compression. Confidentiality must be guaranteed for all files, inclusive of the predictable ones. The protection of the entire device should not depend upon the security of a single aspect (single factor of failure), and the security level must no longer crumble while a single issue is compromised. The server as a trusted thing with represent to user authentication, access control to manipulate and extra encryption. The server isn't relied on with respect to the confidentiality of data saved at the cloud service provider. Therefore, the server is not able to perform offline dictionary attacks. Anyone who has access the storage is taken into consideration as a ability attacker, consisting of personnel at the cloud storage provider and the cloud storage provider itself. In our thread model, the cloud storage provider is honest but curious, that means that it contains out its responsibilities but might try to decrypt records stored with the aid of customers. And also implement back up recover scheme to recover data at the time of infrequent access. Admin can be sent alert to every 3 days, one week, two weeks and three weeks. If the users not login to the system means, automatically recover the data and forward to alternate storage with mobile intimation.

3.1 ALGORITHM
3.1.1 Duplication Checking

Input: a chunk data list of super-chunk S, {fp1, fp2, … , fpn}

Output: a target node ID, i

1. Select the k data chunk {rfp1, rfp2, …, rfpk} and sent the chunk to candidate nodes with IDs {rfp1 mod N, rfp2 mod N, …, rfpk mod N} in the deduplicaton server cluster with N nodes;

2. In deduplication server cluster, obtain the count of the existing representative data chunk of the super-chunk in the candidate nodes by comparing the representative data chunks of the previously stored super-chunks in the similarity index. Index comparison was performed using Map-Reduce framework. The returned k count values are denoted as {r1, r2, …, rk}, which are corresponding to the resemblances of S in these nodes;

3. Mapper find the duplicate content then reducer eliminates the redundant content.

4. Choose the deduplication server node with ID i that satisfies ri/wi = max{r1/w1, r2/w2, …, rk/wk} as the target node.

In this architecture diagram, implement privacy based secure compression scheme to multiple types of data files at the time data storage and retrieval and using acknowledge system to know the status of login time. Data owner can be uploading the files with various file formats. And check the similarity of data using chunk based Map Reduce algorithm. File name and file content should be analyzed. If both the contents are same means, server rejects the files. Otherwise file encrypted using symmetric encryption algorithm. Server can implement self-destruction system to recover the data from blocked account and provide alert system at the time of recovering. User can get all back up files in user manager mail with real time mobile intimation. And also provide acknowledgement about mail delivery.

IV. EXPERIMENTAL RESULTS

Experimental results have the results of the proposed work. Proposed work was implemented using PHP is a front end and MySQL is a back end process. Below mentioned screenshots shows the process of duplication checking and file storage.

Fig 5.1: Data Owner Login

Here data owner can login using their username and password. Registered owners are only allowed to access the cloud and upload files.

Fig 5.2: Storage Space Details

This figure shows the storage space details. User request is accepted by admin and space allocated to the user for storage.

Fig 5.3: File Upload

Here shows the file upload process handled by data owner. Owner can upload files on the allocated space. Files are encrypted and stored on cloud server.

Fig 5.4: File Name Checking

Above figure shows the process of duplication checking. Here currently uploaded files are compared with database for checking duplicate occurrence. If filename was found it will show the error message "File name already exist change name".
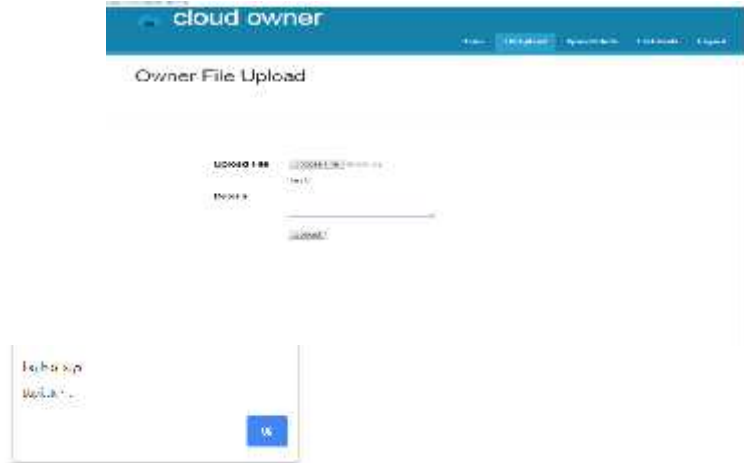

Fig 5.5: Duplicate Intimation

This will shows the process of duplicate checking based on file content. After verification of file name file content will be check. During verification similarity identification is performing to find duplicates. If file content already present it will shows the error message "Duplicate file".

Fig 5.5: Backup Recovery

Backup recovery is the process of sending backup data to the data owner. In this work, owner login constraints are check by admin and send notification to the data owner. If owner could not login within the time duration, it will automatically send the data backup to the owner's email.

VI.CONCLUSION

Proposed the distributed compression systems to improve the reliability of data while achieving the confidentiality of the users and also shared authority outsourced data with an encryption mechanism. Four constructions were proposed to support file-level and block-level data compression. The integrity and security of tag consistency were achieved. We implemented our compression systems using the secret sharing scheme and demonstrated that it incurs small encoding/decoding overhead compared to the network transmission overhead in regular upload/download operations. In this proposed work, have identified a new security challenge during data accessing in the cloud computing to achieve privacy-preserving access authority sharing for similarity files. Authentication mechanism is implemented to guarantee data confidentiality and data integrity. Data anonymity is achieved since the wrapped values are exchanged during transmission. User privacy is improved by access requests process to privately intimate the cloud server about the users access desires. The backup recovery scheme is to improve the recovered scheme to avoid the blockages and also refund the amount to unused spaces in cloud system.

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Trends on Customer Purchases in E-Commerce using Big Data

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Abstract- In the epoch of Bigdata, the customers view the surplus of the economy, while the social commerce grows enormously. This paper started with the concept of providing the customers trustworthy product with reasonable discount and quality products in e-commerce websites. As well as, this determines the better product comparing some of the e-commerce websites. This is done by using the result of the dataset which comprises the details of distrust level, range of discounts and the customer feedback that is analyzed using Apriori algorithm in RStudio. The frequent quality product purchased is displayed to the customers in a user friendly website.
Index termss: Big Data, Apriori algorithm, Xml.

I. INTRODUCTION

Big data refers to data sets that are too large or complex for traditional data-processing application software to adequately deal with. This paper throws light on various methods and concepts related with the analysis of products based on the customer feedback which depends on distrust levels and discount rates.

E-commerce is the activity of buying or selling of products on online services or over the Internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. E-commerce allows customers to overcome geographical barriers and allows them to purchase products anytime and from anywhere.

Online and traditional markets have different strategies for conducting business. E-commerce has evolved to make products easier to discover and purchase through online retailers and marketplaces. Independent freelancers, small businesses, and large corporations have all benefited from ecommerce, which enables them to sell their goods and services at a scale that was not possible with traditional offline retail.

Ecommerce allows you to buy and sell products on a global scale, twenty-four hours a day without having the same overheads as you would with a brick and mortar store. For the

best marketing mix and the best conversion rate, an e-commerce venture will also have a physical presence, this business is known as ass click and mortar store.

II. LITERATURE REVIEW

Zhao Huang et al [1], have proposed an article that offers a new theoretical model and a set of principles for guiding social commerce design.

Similarly, Ting-Peng Liang et al [2], presents a model that integrates several elements in social commerce research and to summarize the previous working papers and abstracts included in this singular issue.

Sanghyun Kim et al [3], imparts that in Korea, customers trust is the major factor for the success of s-commerce and it requires more effort to gain trust. This study identifies the key factors in s-commerce such as transaction, safety, quality, reputation and communication. The article indents to develop a successful business model for providing the customers with the trustworthy services and it also relates the trust of the consumers and word-of-mouth intentions.

Mihyun Chung et al [4], articulates the research based on ICT convergence industries of technology revolution. It examines the researches done in the article submitted to APIC-IST 2015 in the industrial revolution field and are related to the fourth industrial revolution that are categorized based on the keyword frequency of main issues.

Xiao Liu et al [5], investigates about the product differences in the context of individuals in adoption of E-commerce where the consumer's behavior is studied. This shows that purchasing of goods as compared to the services over the internet the E-commerce adoption decisions are more strongly influenced by their level of risk

Lina Zhou et al [6], have proposed an article that suggest a brief overview of social commerce research and practice in light of the wide attention it has drawn in the industry. It suggests a report of preliminary findings from a bibliometric study of academic and industry publications in social commerce to reveal recent trends and research topics, as well as some verifications of the research framework.

Geng Zhou et al [7], uses large-scale datasets to look up two important characteristics from the top two group-buying websites in China, namely the diffusion process and scrutinize mass media communication (MMC) and interpersonal communication (IPC) during different timelines in the buying process, indicating that MMC and IPC at the start of the process can positively have an effect on the sales, while it leads to reduced sales during the ending period in fixed-price group-buying.

Jingting Shao et al [8], suggest in the article that, the measurement constructs for program context and program success has been developed. The most important leadership competences for program managers are identified. Program managers have higher leadership competences than project managers.

III. PREVIOUS WORK

In previous application data surveys were conducted among various demographics of China's online social commerce market [9]. The idea that product types may determine the degree of consumers' distrust even when identical discounts are offered for those products was the main aim behind the project. The product preferences and selection was analyzed determine if distrust negatively affected consumers' purchase attitudes from consumer feedback collected through extensive data surveys conducted as part of the project. 20 representative products that are commonly sold on social commerce websites in China were chosen to examine the relationships among product types, discount rates, distrust levels, and purchase attitudes. Manual data analysis was done on the data collected from these data surveys. For each product, manual analysis was done based on the product discounts. The consumer feedback helped to classify the products on the basis of their distrust levels. Different products from different categories were taken into account for analysis. Inductive interview was used to collect the data as well as consumers' perceptions of the relationships. The product discounts implicated the distrust levels as a three way classification system of high, medium and low. Data analysis results suggested that consumers like deep discounts, but their distrust levels increase along with the discount rates, however, the levels of increasing distrust vary according to product types.

IV. PROPOSED MODEL

The project analyses that the sales among customers with respect to product discount rate and distrust levels of various product types in the e-commerce market scenarios. In this, dataset are created based on discount details for different product types and from consumer feedback regarding the purchase obtained from a user webpage. The datasets are statistically analyzed based on product discount rate and classified based on their corresponding distrust levels (a three way classification as high, medium and low) for each product. The R-tool implements on the dataset Apriori algorithm and analyses the consumption trends among consumers. The results are displayed in webpage by linking R-tool with xml code. The webpage is user friendly and makes it easier for the consumer to choose between the least to most trustworthy e-commerce website for purchasing the product. It is predicted that, even though the discount rate increases, the dubiety level is not decreased among the consumers. The advantage of this includes implementing the Apriori algorithm on the retail information in e-commerce websites and displaying the results in a user friendly webpage for consumers.
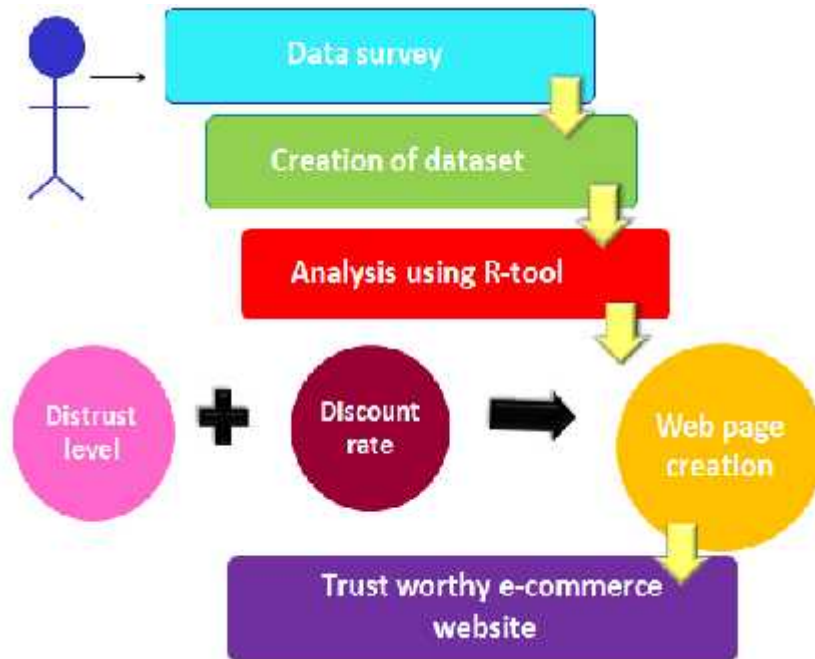
V. SYSTEM ARCHITECTURE

Figure 1: Application architecture

Our application consists of different layers in the architecture where we create a dataset having discount details for different product and consumer feedback to do opinion mining. A three level classification of distrust levels as high, medium and low is created for the products based on product discounts. The dataset is statistically analyzed by implementing Apriori algorithm using R tool. A webpage is created to display the output after data analysis by linking the xml document with R tool.

GENERAL APPROACH:
DATASET CREATION

To create a dataset having discount details for different product and consumer feedback to do opinion mining.

DATA ANALYSIS USING R-TOOL

Creating a three level classification of distrust levels as high, medium and low for the products based on product discounts. To implement apriori algorithm on the dataset and to statistically analyze the datasets using R tool.
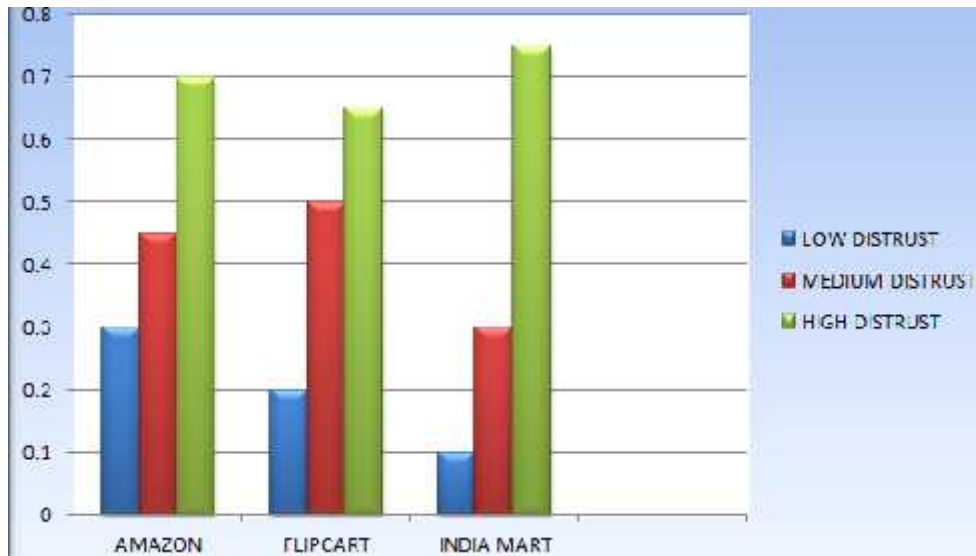
OUTPUT DISPLAY IN WEB PAGE

To create a webpage to display the output after data analysis by linking the xml document with R tool.

VI. STIMULATED RESULTS

The stimulated results shows results for buying a pen drive in websites such as Amazon, Flip cart and India mart based on the given product discounts on the sites and analysis of consumer feedback. This result will be displayed in a user friendly webpage. Rhe webpage would contain similar results displaying the purchase trends among the consumers for many

different products.

VII. CONCLUSION AND FUTURE WORK

This project creates a dataset having discount details for different product and consumer feedback to do opinion mining. Also creating a three level classification of distrust levels for the products based on product discounts. This project statistically analyzes the datasets and implements Apriori algorithm on the given dataset using R tool and to create a webpage to display the output after data analysis by linking the xml document with R tool. In future, the dataset can be created on existing large scale online e-commerce websites.

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Secure PIN confirmation for ATM Transactions using Wireless plans

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Abstract— Now-a-days many unauthorized access and theft takes place in ATM machines. In general, all the keypad based verification system has several possibilities of password guessing by way of shoulder movements and skimming device attacks. Shoulder-surfing is an attack on secret code authentication that has traditionally been hard to defeat. At the same time the growth of mobile technology, with regard to availability of services and devices like Smartphone's has created a new occurrence for message and data processing capability to do Daily Works. One such phenomenon that has emerged in the Social work Environment is BYOD (Bring Your Own Device), which means the users can use their personal device to access company resources for work [12]. This paper proposes a Wireless Pin Authentication Method (WPAM) for secure transactions using BYOD trend. In addition to that Kerberos authentication protocol is used for user's authentication. Hence, considered as a reasonable trade-off between safety, usability and cost. So, this paper mainly concentrates on providing efficient security to ATM against theft.

Keywords— Personal identification number, Skimming attack, Pin Verification, Shoulder surfing attack, Wi-Fi.

I. INTRODUCTION

Nowadays many unauthorized access, threats and theft takes place in ATM machines. Currently PIN numbers are used for security in ATMs. The crime rates are also increased with fleeting time and will never fall as attackers are efficient enough with all detailed criminal knowledge collected with them. The service provider must promote a stable security of user data for customer satisfaction. The goal is to protect ATM from theft using counter measures for security. As the ATM related security are public and published in newspaper and internet. So the security measures applied are known to both the regulator and attacker. Nowadays we use 4-Digit PIN code for safety and security for money deposition and transaction. But in real the PIN numbers can be hacked easily through specific fraudulent activities and it can be observed by human or device attackers. The attackers now are technically knowledgeable they have every idea about the usage of the user. At first, the attacker will try hacking the 4-PIN code using finger prints plated in the number box. Then the hacker tries hacking the bar code of the card using the detector and a duplicate card of the user is framed for theft. Through this method the thief can withdraw our money without the regulators knowledge and initiate theft without any doubt.

Currently Personal Identification Number (PIN) is used for security in ATMs and authentication is provided by the Users entering (PIN). This PIN numbers can be hacked easily through specific fraudulent activities and it can be observed by human or skimming device attackers. So, this paper proposes a Wireless Pin Authentication Method (WPAM) for secure ATM transaction using Wi-Fi technology. In this method, customers use their own wireless devices (Laptop, Smartphone and Tablet) for ATM Transactions.

In general, all the keypad based authentication system has several possibilities of password guessing by means of shoulder movements and skimming device attacks. The main objective of this paper is to develop a secure ATM Transaction for users using their own wireless devices (Laptop, Smartphone and Tab).

II. RELATED WORKS

Several Pin Authentication Methods are discussed as follows,

2.1 Black and White (BW) Method where the regular numeric keypad is colored at random, half of the keys in black and the other half in white, which is called as BW technique. A user who knows the correct PIN digit can answer its color by pressing the separate color key. The basic BW method is expected to resist a human shoulder surfing attack. But if the selected halves were memorized or written on a paper for m consecutive rounds and recalled to derive their Grouping Patterns, the shoulder surfer could recognize a single digit of the PIN.

2.2 Fake Cursors Method [2]: To hide password entry on on-screen keyboards. The objective of the fake cursor is, adding overhead to the input to make it hard to monitor. The authors suggest several concurrent cursors that move in the exact same way to quickly reach objects on big screen spaces. In the past which include; chip distortion, card misplacement. Card fraud, etc. these entire problems are associated with using smartcard access control in ATM. To overcome these problems it is advisable that government should partner with banking sector to implement the use of biometric technique "intelligent voice-based access control" in ATMs, as this will eliminate completely the problems associated with smartcard access control [8, 9, 10].

2.3 Attacks on Pin Entry:

2.3.1. Shoulder Surfing Attack

In a shoulder-surfing attack (SSA), the attacker detects the logon procedure by looking over the user's shoulder, and tries to recover that user's PIN. The SSA may be done directly through the human eyes or by using any electronic devices such as fixing a skimmer device or mini cameras at ATMs [4, 6, 13].

2.3.2. Skimming Attack

A device that reads and stores magnetic stripe information when a card is swiped. Attackers can fixing a skimmer over the card slot of an ATM and store customers' credit information without their knowledge. Later, this information can be retrieved and used to make duplicates of the original cards [5, 13].

2.3.3. Eavesdropping Attack

In Eavesdropping attack, the Eavesdropper secretly listening to another person's conversation. In this attack the Eavesdropper secretly observing the users pin entry.

2.3.4. Guessing Attack

In a guessing attack, the attacker guesses a user's PIN and inputs it to pass the test. The most common type of attack is password guessing. Attackers can guess passwords locally or remotely using either a manual or robotic approach. For example, a typical ATM permits three trials [13].

III. PROPOSED SYSTEM

The main objective of this system is to develop a secure ATM. In general, all the keypad based authentication system having several possibilities of password guessing by means of shoulder movements. Shoulder-surfing is an attack on password authentication that has traditionally been hard to defeat [1]. Automated Teller Machines (ATMs) security is the field of study that aims at solutions that provide multiple points of protection against physical

and electronic theft from ATMs. Authentication of users at automatic teller machines (ATMs) is mostly dependent on PIN-based verification. This paper proposes a Wireless Pin Authentication Method (WPAM) for secure ATM transaction using Wi-Fi technology. In this method, customers use their own wireless devices (Laptop, Smartphone and Tablet) for ATM Transactions. Wi-Fi is commonly called as wireless LAN, it is one of those networks in which high frequency radio waves are required for transmission of data from one place to another[15]. Wi-Fi operates on several hundred feet between two places of data transmission. This technology only works on high frequency radio signals. Otherwise, it will not work properly. Nowadays this technology is used as office or home network and in many electronic devices.

Wireless LAN or Wi-Fi is divided into three main parts on which its whole working depends and all of its applications also depend on these parts i.e. infrastructure mode, ad hoc network and mixed network[15]. Kerberos authentication protocol is used for user's authentication. It works on the basis of 'tickets' to allow nodes communicating over a non-secure network to prove their identity to one another in a secure manner. Kerberos protocol messages are protected against eavesdropping and Replay Attacks [14].
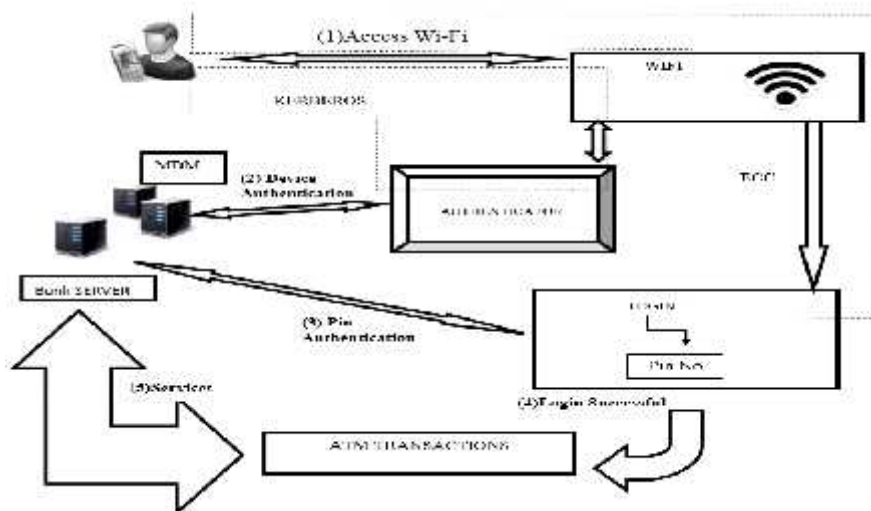

Fig. 1 Proposed system

3.1 Steps in the proposed model:

- Registration of the user with the bank: After the registration, the wireless devices carry the public key of the user which has been signed by the bank as well as the public key of the bank.
- Optionally, the wireless device also carries an application which enables it to communicate with the ATM.
- Once that form is submitted, a unique PIN is send to the respective mail id of the user.
- Users connect the Wi-Fi enabled LAN in their Wireless Devices using the Pass code. So, Wi-Fi act as interface between wireless devices and ATM
- User authenticates himself to the wireless devices using his pin
- A wireless device authenticates itself to ATM by presenting the user's 'tickets' and responding on ATM's challenge.
- Kerberos authentication protocol is used for user's authentication[14].

- It works on the basis of 'tickets' to allow nodes communicating over a non-secure network to prove their identity to one another in a secure manner.
- ATM authenticates itself to the Wireless devices by presenting its own 'tickets'. User now access the service of the ATM using the signed application.

IV. PERFORMANCE EVALUATION

4.1 BW Method

The basic BW (Black and White) method was designed to resist a human shoulder surfing attack and called the immediate oracle choices (IOC) by viewing a user as a human oracle to a system. In each round, the regular numeric keypad is colored at random in two distinct colors; half of the numeric keys in black and the other half in white.

4.2 Fingerprint Verification Method

The fingerprints of any person remains the same throughout the life and no two fingerprints are ever same. But for this to work accurately it requires clean hands without having any injuries to their prints otherwise it'll prevent proper identification

Financial bodies like banks and other organizations need to think on it and should spend extra effort and money in biometric technology and they should also endorse as a way of securing commercial transactions, across the counter and at the same instance while using the ATM.

4.3 WPAM Method

In general, all the keypad based authentication system having several possibilities of password guessing by means of shoulder movements. Shoulder-surfing is an attack on password authentication that has traditionally been hard to defeat. Automated Teller Machines (ATMs) security is the field of study that aims at solutions that provide multiple points of protection against physical and electronic theft from ATMs.

Authentication of users at automatic teller machines (ATMs) is mostly dependent on PIN-based verification. This project proposes a Wireless Pin Authentication Method (WPAM) for secure ATM transaction using Wi-Fi technology. In this method, customers use their own wireless devices (Laptop, Smartphone and Tablet) for ATM Transactions.

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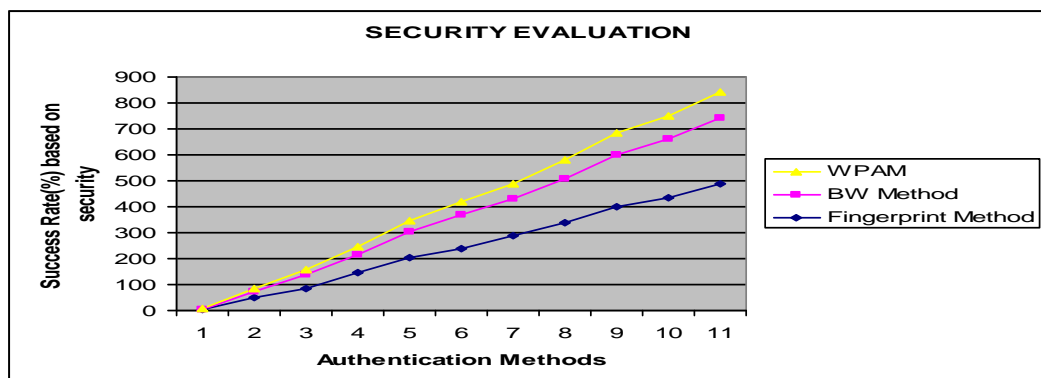
ig. 2 Security Evaluation

V. CONCLUSIONS

In general, all the keypad based authentication system has several possibilities of password guessing by means of shoulder movements and skimming device attacks. Shoulder-surfing is an attack on secret code authentication that has traditionally been hard to defeat. At the Same time the growth of mobile technology, with regard to availability of services and devices like Smartphone's has created new phenomenon for message and data processing capability to do Daily Works. One such phenomenon that has emerged in the Social work Environment is BYOD (Bring Your Own Device), which means that users can use their personal device to access company resources for work [12]. This paper proposes a Wireless Pin Authentication Method (WPAM) for secure transactions using BYOD trend. In addition to that Kerberos authentication protocol is used for user's authentication.

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Analysis for DDOS Attacks in Big Data (Hadoop)

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Abstract—**Big data** *is* **data** *sets that are so voluminous and complex that traditional* **data-***processing application software are inadequate to deal with them.* **Big data** *challenges include capturing* **data,** **data** *storage,* **data** *analysis, search, sharing, transfer, visualization, querying, updating, information privacy and* **data** *source. Traditional tools and techniques are not sufficient to handle Big Data operations like Big Data management, sorting, storing etc. For this purpose distributed file system has been* **introduced, Hadoop (HDFS, Mapreduce) is mostly used for Big Data's operations. Most** *companies adopted and shifted their business to BigData (Hadoop), but still some companies like Govt. organizations and other security firms are hesitating to shift on it due to its security lags.This research work is about availability threats like Distributed Denial of Service (DDoS) attacks, i.e. Hadoop servics become unavailable due to system failure/crash and disrupt the re- sources.. DDoS attacks are very challenging issues and gaining interest of many researcher. One of the solutions of DDoS is redundancy. This research is about the analysis of DDoS attacks on Hadoop different models and approaches to check Hadoop behaviour during DDoS attack and impact of DDoS in Hadoop different models.*

I.INTRODUCTION

By increasing the usage of electronic media and shifted everything on internet, the rate of data flow over internet has been increased; this rate of data production which is structured and unstructured cant be processed and managed via traditional methods . Structured data is the well sorted data which can be stored in traditional databases like library catalogues, census etc. whereas Unstructured data is the data which cant be manage, store by the traditional databases like videos, pictures, media files, etc .

This structured and unstructured data having 3Vs features (Velocity, Volume and Variety) and known as Big Data, later on 2 more Vs has been added to bigdata definition which is (Value and Veracity). To handle big data the distributed framework has been

introduced, Hadoop is one of famous framework used for Bigdata management, sort, store and distribution . Hadoop was not designed for the enterprise environment so had not included security in its design. It was considered for Hadoop deployment that the network is fully secured and trusted in which it is used but as in enterprise environment the threats are day to day evolved and nothing is secured over the internet. Due to Hadoop using in public network the security in Hadoop has became the need.

The major security threats are Confidentiality, Integrity and Availability.There are lot of modifications made and new modules have been developed and introduced in Hadoop to handle these security threats but still the Hadoop security is evolving and not too much mature. This research only address the Availability threats of Hadoop. Apache Hadoop has already introduced some modules to handle with Failover issue like Zookeeper, JournalNode etc. In this research work these solutions of Hadoop have been tested along with its effectiveness against availability threats.
What are Hadoop Security Threats?
Security is defined in CIA (Confidentiality, Integrity, Availability)

1.1.Confidentiality

In Hadoop is that the data A can only be read by the respective client A and no other clients have accessed to read that data. We can say that data stored on datanode can only be accessible by the respective clients to make it confidential for the rest of the world.

1.2 Integrity

Integrity means data retain its state same as was submitted on the datanode and read in the same state from the datanode. Data wont be modified whenever store on the datanode and no one else having write permission for that data but except the respective person. Same during the data sorting it wont be lose its attributes like permissions etc.

1.3 Availability

Hadoop resources are available for clients, like Hadoop namenode, datanodes for data processing, distribution and storing. Availability means that all resources are utilized to entertain the actual requests of Hadoop but not to engage to entertain bulk or fake data or requests.
Suppose Hadoop nodes are secure against integrity and confidentiality threats but not against the availability threats so all is in vain because if resources are not available what is the benefits of integrity and confidentiality?

II.HADOOP DEPLOYMENT MODELS

Hadoop is a java based framework which is configured as:

2.1 Standalone Mode

In single mode Hadoop is configured on single hardware and all the Hadoop processes run in single JVM (java virtual machine). Client directly interact with the Namenode by using the facilities or interfaces provided to him as RPC, SSH, HTTP [4] etc. and then send the request to read or write data which first handle by the namenode and forward the request to specific datanode to perform actual operation. The metadata is stored in namenode which helps it to find the actual data path.

2.2 Pseudo-Multi Mode

In pseudo-distributed mode the Hadoop is installed on single hardware but every function has its own JVM. There are two nodes installed in Pseudo-distributed mode, Master node and Slave node. Master node contains the Namenode, Jobtracker, Datanode, etc. whereas the slave nodes have datanode and tasktracker only. Master node works as supervisor to order the slave nodes and slave nodes work as a worker to do actual work on data.

2.3. Multi Mode

The pseudo-distributed and fully-distributed modes hav- ing same configuration except the hardware as in pseudo- distributed mode the hardware is single and there are multiple VM, s whereas in case of Fully- distributed mode there are multiple hardware machines at least two which are used separately for each process. To configure the fully-distributed mode it must be keep in mind that there are synchronized hardware used across the network and also having redundant network to support load balancer and HA (high availability).

III.TOOLS USED

VMWare workstation 9.0, Java JDK 1.7, Apache Hadoop 2.7.1, YARN 2.0/MapReduce, JournalNode, Zookeeper, HDFS, Ubuntu 14.0.4, LOIC (UDP, HTTP, TCP Flood), HOIC (HTTP,TCP Flood), TRIN00 (UDP Flood), Bmon,IPtraf, TCPTracker, Slurm.

IV.DOS ANALYSIS

Due to limited resources Hadoop multi-mode cant be deployed and tested on single hardware machine as it re- quired separate hardware machine for each role at least two physical machines. In this research work single node and pseudo-distributed nodes are used for analysis. Only one Masternode need to

configure in both pseudo-distributed and fully distributed mode. Single Master or namenode can control thousands of Slaves or datanode.

4.1 DDoS On Single (Standalone) Mode Hadoop

In single (standalone) mode of Hadoop configuration (shown in figure no. 1) all the Hadoop processes are running in single JVM (java Virtual Machine) and there is no master, slave concept in Hadoop single node. In single node (standalone) Hadoop the node itself is master and slave work as a namenode and datanode both. For DDoS on single (standalone) mode Hadoop is configured on single standalone Ubuntu 14.0.4.
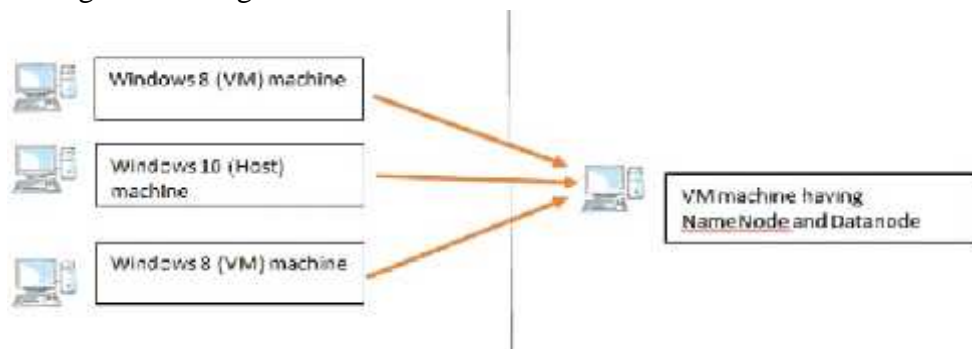
Hadoop datanode and namenode are configured and run from the same machine. The Attack environment which is used for single-node Hadoop is as below figure 2:

Figure 2 is the test-bed for single node Hadoop. In this test- bed Ubuntu has been installed on VM machine and Hadoop

DDOS Attack (HTTPS, TCP, UDP) Flood	NAMENODE	DATANODE	READ/WRITE OPERATIONS	USER ACCESS TO DATA
	DDOS	Down/Not Accessible	Not Working	Disabled
	Down/Not Accessible	DDOS	Not Working	Disabled

Figure 2:DDoS Attacks Results On Single Node/ Standalone Hadoop

For DDoS attack three machines has been used in which two are VMs having Windows 8 operating systems and third one is the Host machine which have windows 10 operating system. DDoS attack tools like LOIC, HOIC, Trin00 has been installed on all three machines and launched attacks as UDP, TCP, HTTP Flood on hosted VM having Hadoop Installation. LOIC and HOIC have used for UDP, TCP and HTTP Flooding whereas Trin00 is only used for UDP flood attack. Ping of death attack has also been tested by crafting packet with the size of 65535 Bytes in CMD but its discarded.

4.2 DDoS On Pseudo-Multi Mode/ Pseudo- Distributed Mode

For pseudo-multi-mode or pseudo-distribution, hardware is single but every process is running in separate JVMs. There are two nodes works in Hadoop pseudo-distributed mode, Master and slave nodes. Master Node having job- tracker, namenode, datanode, resource manager etc whereas the slave node only having tasktracker, Datanode. Master node acts as a supervisor to forward the job or process to slave nodes which actually do work on it and save it in datanode. Master node contains the metadata whereas the actual data is stored on datanode. In Pseudo-distributed setup the Hypervisor install on the Hardware layer. It can

be Bared-Metal or Hosted. Then virtual network is created on this hypervisor and VMs created from which one VM act as a Master whereas others are acting as Slaves. Pri- mary namenode run from masternode whereas Secondary namenode can be run from any slave node depends on the configuration. All slave nodes are Datanodes to save the data. As shown in Figure 3: pseudo-distributed node has been configure as two namenodes and four datanodes clusters as test-bed. namenodes are also act as the datanodes
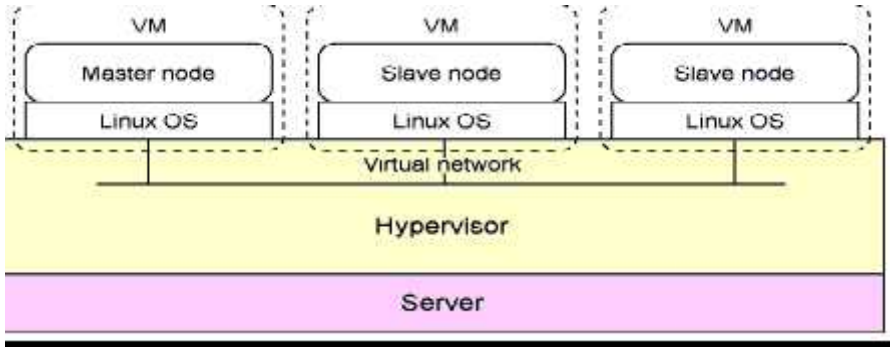
Fig. 3. Pseudo-Multi Node Clusters

4.3 DDoS Attacks results on Pseudo-Distributed Mode Hadoop: In pseudo-multi node when DDoS executes on Network level it choke the whole network and services are totally disrupt. It can be mitigate by using the redundant network cards and configured them as HA and Failover. Now assume that there are multiple network cards configured as HA and Failover so it means when one network got affected by the DDoS traffic shifted to other NIC to maintain the service .
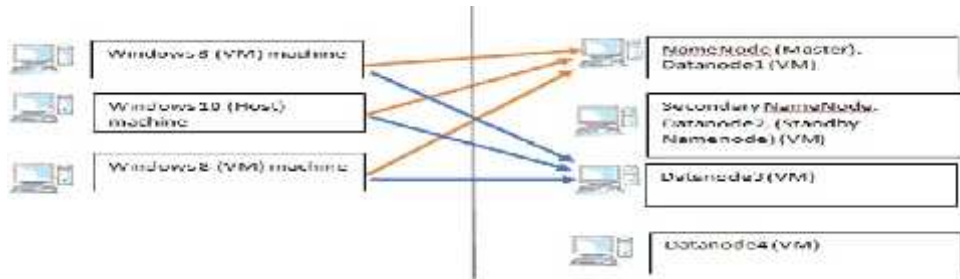

Fig.4:Pseudo-Multi Node DDoS Attacks Lab Setup

	NAMENODE	SECONDARY NAMENODE	DATANODE 1	DATANODE 2	DATANODE 3	DATANODE 4	READ/WRITE OPERATIONS	USER ACCESS TO DATA
DDOS Attack (HTTPS, TCP, UDP) Flood	DDOS	Active but Not Facilitate Users	Not Accessible To Users	Not Accessible To Users	Not Accessible To Users	Not Accessible To Users	Not Working	Disabled
	Active	DDOS	Active	Active	Active	Active	Working	Enabled
	Active	Active	DDOS	Active	Active	Active	Working	Enabled
	Active	Active	Active	DDOS	Active	Active	Working	Enabled
	Active	Active	DDOS	DDOS	Active	Active	Working	Enabled
	Active	Active	DDOS	DDOS	DDOS	Active	Working	Enabled

Fig. 5. DDoS Attacks Results on Pseudo-Distributed Mode Hadoop
Without HA

Now start from the Hadoop basic configuration which is Hadoop without zookeeper and JournalNode. Hadoop has been setup like having one primary namenode, one secondary namenode and four datanodes. Now results of DDoS attacks in this scenario are when namenode is the target there is no any other namenode to serve the services to clients,

which means services disrupt. The results of DDoS attacks in a pseudo-distributed mode when there is only one NameNode Configured and HA not configured is as below:

Table 5 shows that there is no impact of DDoS until all DataNode not Down. But there is high impact of DDoS attack if Primary NameNode down so its shows the primary namenode criticality.Now have DDoS attack on one of the datanode when the namenode is in working, one of the datanode get down. As there is replication of four in test-bed which means all the four datanode having the same copy of data. In case of one datanode down, namenode is still alive and data is also present on other three datanodes which are active. When any client request for data, its request will easily be entertained by the namenode to forward it to available datanode/s. In this analysis the results shows that services will be disrupt in case of namenode down but in case of datanode down services are not going to down until and unless all DataNodes are not going to be down.Now JournalNode has been installed on three NameNodes which is minimum recommendation of JournalNode for tolerable failure of JN and calculate by using the given formula:

$$\text{Failure Tolerate by JN} = (N-1)/2 \; [23]$$

Where N is the total number of JN configured. It is recom- mended that N must be an odd number (3, 5, 7). Suppose in this test-bed there are three JN so it means (3-1)/2=1 which means one failure tolerable but in second failure the effects are same as for without JN configuration.

4.4 Load Analysis On All Nodes

By using the the Slurm traffic on all Hadoop nodes before and during DDoS attacks has been monitored. Below mentioned figure 8 show the traffic monitoring on Hadoop slavenode by using slurm.

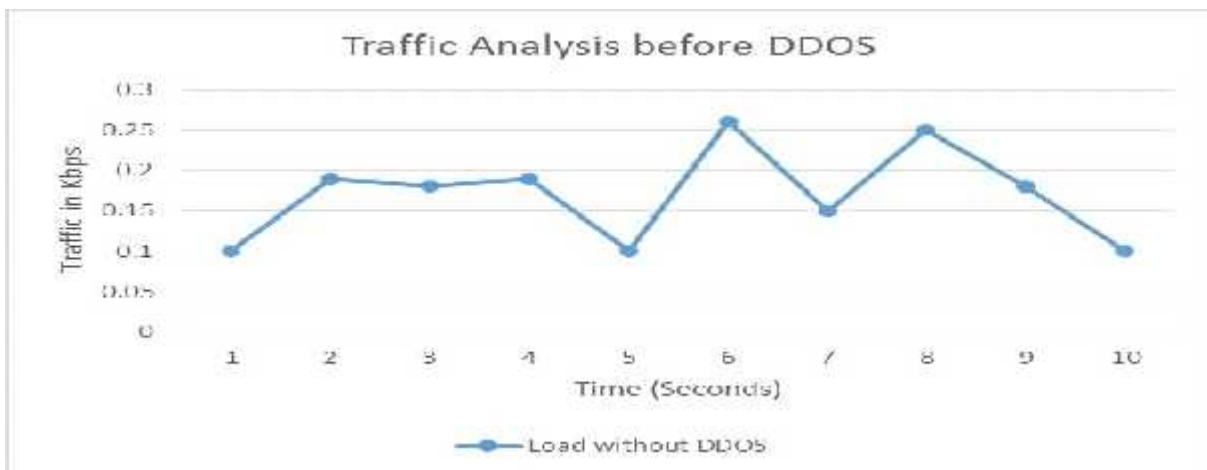Fig. 8. Traffic Monitoring by Using Slurm Before and During DDoS
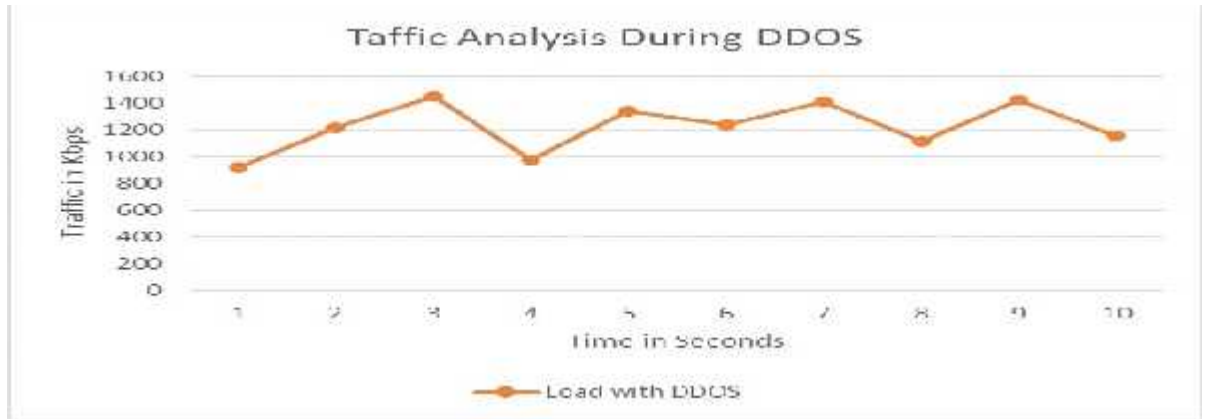
Fig. 9. Traffic Analysis before DDoS attacks

Fig. 10. Traffic Analysis during DDoS attacks

The Figure 10 shows the traffic analysis which has been recorded during the DDoS attacks launched on all Hadoop nodes one by one. The graph shows the inbound traffic increased to 1.6Mbps.
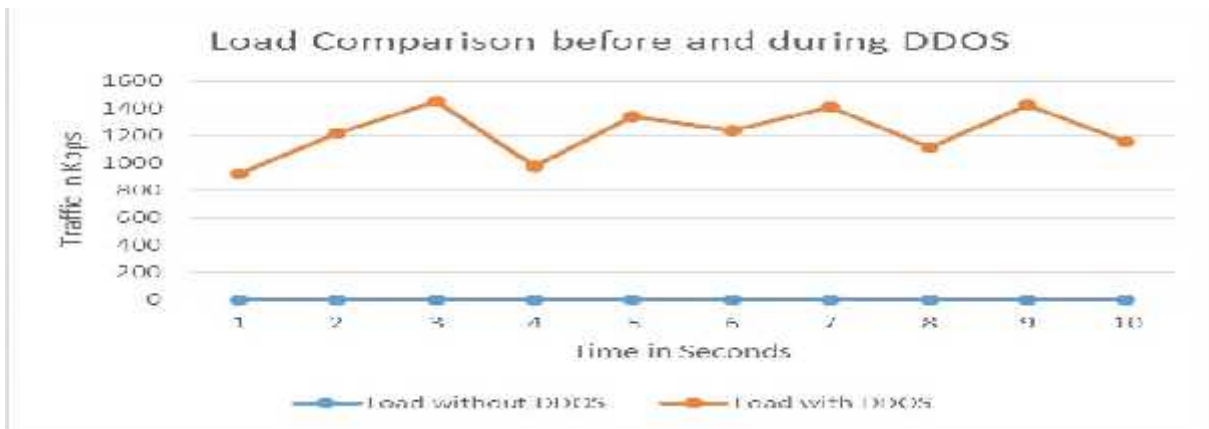

Fig. 11. Load Comparison before and during DDoS attacks

Figure 11 shows comparison results of load/traffic monitoring before DDoS attack launched on all nodes and during the DDoS attack. As its clearly shows in graph the load has been increased and is too high during the DDoS attacks which cause the services degradation. It has been monitored the load continuously increased and checked that after sometime services disrupt and victim node has become dead or inaccessible. As comparison graph shows that traffic load during DDoS attack on all nodes is too much high as compare to load before DDoS attack was launched. The response time of nodes during DDoS also decreases, which causes the services to degrade, and if DDoS continues then disruption of service will be the outcome.

V CONCLUSION

It has been concluded that the impact of DDoS attacks on Hadoop has to be minimized by using the proper con- figuration of JournalNode and Zookeeper for Namenode. As there are multiple datanodes under the single namenode, and multiple copies of data has been stored on multiple datanodes which metadata is saved and stored on namenode. So there will no loss of services in case DDoS succeeded on Datanode as there is already present the replica copy of same data on other datanodes and request will be fulfil by the namenode by forwarding it to available datanodes. To down the Datanode attacker required to down all active datanodes which is very hard to do. There is single point of failure in Hadoop which is namenode but by using JournalNode and Zookeeper it is quite secure from the DDoS attack as services is running smoothly when the DDoS successful on Primary Namenode.

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Degraded Peri-Ocular Image Recognition In Enrollment System Using Deep Neural Networks

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Abstract—With the wide spread exploitation of biometric identification schemes, establishing the authenticity of biometric data itself has emerged as an important research issue. The fact that biometric data is not replaceable and is not secret combined with the existence of several types of attacks that are possible in biometric system, makes the issue of security/integrity of biometric data extremely critical. A Mono-modal Biometric system encounters a variety of security problems and presents sometimes unacceptable error rates. Traditional biometric system tends to have larger memory footprint, slower processing speed, and higher implementations and operational costs. Multiple biometric contain in mingling two or more biometric modalities in a single identification scheme to improve the recognition accuracy. Whereas a state of art of agenda for multimodal biometric identification system which can be adapted for any type of biometrics to provide smaller memory footprints and faster implementations than the conventional multimodal biometrics systems. In this paper we can implement multi modal biometric system to improve the authentication system with security. The multi modal biometric include the face, sclera and iris features. The features of face features include facial boundary values using HAAR cascade algorithm and then detect the sclera parts from eye images and also extract the IRIS features using Curvelet transform. Finally match the features using neural network algorithm to improve the accuracy and reduce false rejection rate. Experimental results shows that proposed system improve security than the existing uni-modal system.
Index Terms—Biometric, Face and Ocular recognition, Features extraction, Verification, Neural network

I.INTRODUCTION

Biometrics refers to metrics related to human characteristics. Biometrics authentication (or realistic authentication) is used in computer science as a form of identification and access control. It is also used to identify individuals in groups that are under surveillance. Biometric identifiers are then distinctive, measurable characteristics used to label and describe individuals. Biometric identifiers are often categorized as physiological versus behavioral characteristics. Physiological characteristics are related to the shape of the body. Examples include, but are not limited to fingerprint, palm veins, face recognition, DNA, palm print, hand geometry, iris recognition, retina and odour/scent. Behavioral characteristics are related to the pattern of behavior of a person, including but not limited to typing rhythm, gait, and voice. Some researchers have coined the term behavior-metrics to describe the latter class of biometrics. More traditional means of access control

include token-based identification systems, such as a driver's license or passport, and knowledge-based identification systems, such as a password or personal identification number. Since biometric identifiers are unique to individuals, they are more reliable in verifying identity than token and knowledge-based methods; however, the collection of biometric identifiers raises privacy concerns about the ultimate use of this information. Identification mode can be used either for 'positive recognition' (so that the user does not have to provide any information about the template to be used) or for 'negative recognition' of the person "where the system establishes whether the person is who she (implicitly or explicitly) denies to be". The latter function can only be achieved through biometrics since other methods of personal recognition such as passwords, PINs or keys are ineffective.

1.1 Multi modal biometrics:

Multimodal biometric systems use multiple sensors or biometrics to overcome the limitations of unimodal biometric systems. For instance iris recognition systems can be compromised by aging irises and finger scanning systems by worn-out or cut fingerprints. While unimodal biometric systems are limited by the integrity of their identifier, it is unlikely that several unimodal systems will suffer from identical limitations. Multimodal biometric systems can obtain sets of information from the same marker (i.e., multiple images of an iris, or scans of the same finger) or information from different biometrics (requiring fingerprint scans and, using voice recognition, a spoken pass-code). Multimodal biometric systems can fuse these unimodal systems sequentially, simultaneously, a combination thereof, or in series, which refer to sequential, parallel, hierarchical and serial integration modes, respectively. Fusion of the biometrics information can occur at different stages of a recognition system. In case of feature level fusion, the data itself or the features extracted from multiple biometrics are fused. Matching-score level fusion consolidates the scores generated by multiple classifiers pertaining to different modalities. Finally, in case of decision level fusion the final results of multiple classifiers is combined via techniques such as majority voting. Feature level fusion is believed to be more effective than the other levels of fusion because the feature set contains richer information about the input biometric data than the matching score or the output decision of a classifier. Therefore, fusion at the feature level is expected to provide better recognition results. Spoof attacks consist in submitting fake biometric traits to biometric systems, and are a major threat that can curtail their security. Multi-modal biometric systems are commonly believed to be intrinsically more robust to spoof attacks, but recent studieshave shown that they can be evaded by spoofing even a single biometric trait. The basic layout of the biometric system can be shown in fig 1.
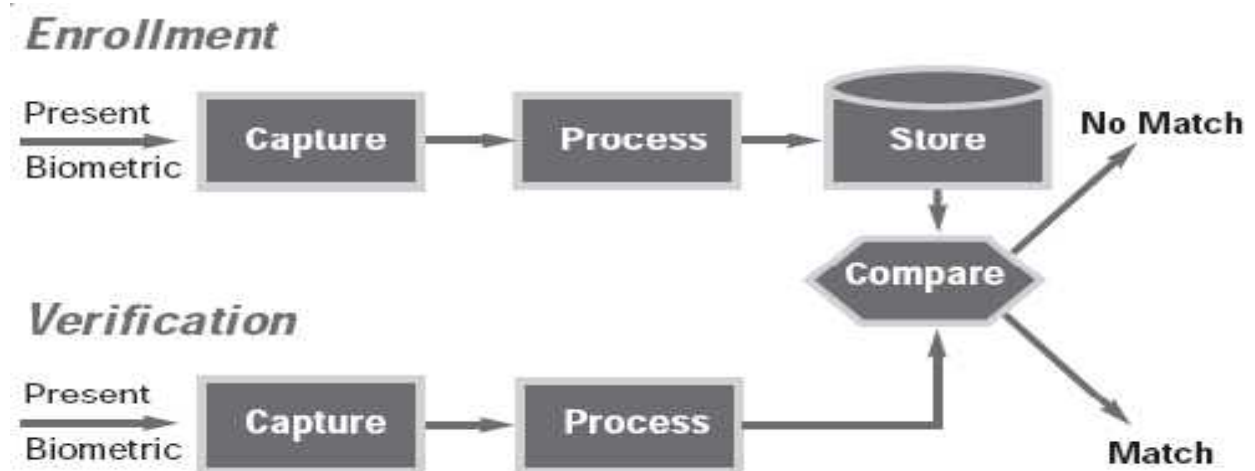
Fig 1: Biometric framework

II.RELATED WORK

Chen, Ying, et.al,…[1]introduced the process of feature extraction and representation based onscale invariant feature transformation (SIFT) in detail. Secondly, three strategies are described, which are orientation probabilitydistribution function (OPDF) based strategy to delete some redundant feature keypoints, magnitude probability distributionfunction (MPDF) based strategy to reduce dimensionality of feature element, and compounded strategy combined OPDF andMPDF to further select optimal subfeature. Thirdly, to make matching more effective, this paper proposes a novel matching methodbased on weighted sub-region matching fusion. Particle swarm optimization is utilized to accelerate achieve different sub-region'sweights and then weighted different subregions' matching scores to generate the final decision. The experimental results, on threepublic and renowned iris databases (CASIA-V3 Interval, Lamp, andMMU-V1), demonstrate that our proposed methods outperformsome of the existing methods in terms of correct recognition rate, equal error rate, and computation complexity.

Tan, Chun-Wei, et.al,…[2] achieved remarkable matching accuracy as iris texture is more clearly preserved in such high quality iris images acquired using NIR imaging under the constrained setup. Accurate iris recognition from the distantly acquired face or eye images under less constrained environments require development of specialized strategies which can accommodate for significant image variations (e.g. scale, rotation, translation) and influence from multiple noise sources. A set of coordinate-pairs, which is referred to as geometric key in this paper is randomly generated and exclusively assigned to each subject enrolled into the system. Such geometric key uniquely defines the way how the iris features are encoded from the localized iris region pixels. Such iris encoding scheme involves computationally efficient and fast comparison operation on the locally assembled image patches using the locations defined by the geometric key. The image patches involved in such operation can be more tolerant to the noise. Scale and rotation changes in the localized iris region can be well accommodated by using the transformed geometric key. The binarized encoding of such local iris features still allows efficient computation of their similarity using Hamming distance. The superiority of the proposed iris encoding and matching strategy is ascertained by providing comparison with several state-of-the-art iris encoding and matching algorithms on three publicly available databases.

Hu, Junlin, Jiwen Lu, et.al,…[3] considered the second one where face images contain significant variations caused by varying lighting, expression, pose, resolution, and background. This paper presents a new discriminative deep metric learning (DDML) method for face verification in the wild. Different from existing metric learning-based face verification methods which aim to learn a Mahalanobis distance metric to maximize the inter-class variations and minimize the intra-class variations, simultaneously, the proposed DDML trains a deep neural network which learns a set of hierarchical nonlinear transformations to project face pairs into the same feature subspace, under which the distance of each positive face pair is less than a smaller threshold and that of each negative pair is higher than a larger threshold, respectively, so that discriminative information can be exploited in the deep network. Our method achieves very competitive face verification performance on the widely used LFW and YouTube Faces (YTF) datasets.

Lu, Jiwen, et.al,…[4] proposed a multiview NRML(MNRML) method to seek a common distance metric tomake better use of multiple feature descriptors to furtherimprove the verification performance. Experimental resultsare presented to demonstrate the efficacy of the proposed methods. Since interclass samples (without kinship relation)with higher similarity usually lie in a neighborhood and aremore easily misclassified than those with

lower similarity,we emphasize the interclass samples (without kinship relation)in a neighborhood more in learning the distance metricand expect those samples lying in a neighborhood arerepulsed and pulled as far as possible, simultaneously, suchthat more discriminative information can be exploited forverification. Inspired by the fact that multiple feature descriptorscould provide complementary information in characterizingfacial information from different viewpoints, wepropose a multiview neighborhood repulsed metric learning(MNRML) method to seek a common distance metricto make better use of multiple feature descriptors to furtherimprove the verification performance. Experimental resultsare presented to demonstrate the efficacy of the proposedmethods.

Umer, Saiyed, et.al,…[5]provided many powerful and important tools for processing and analysis of images. The mathematical morphologic operators treat an image as a set of pixels. Thus the operations are defined as interaction between object and structuring element in set theoretic terms. In digital image processing, flat structuring elements of regular geometric shape like a square or a line or a disk are most commonly used. Erosion and dilation are the most basic morphological operations. Other operations like opening and closing are various combinations of erosion and dilation. In the pre-processing stage, we first localize the iris, i.e., the portion of the image to be actually used in classification. Then, the localized portion is normalized to facilitate the feature extraction. Normalized image is sharpened by a suitable morphological filter to highlight the texture of the iris image. Then, bright and dark top-hat transformations at different scale are computed on normalized iris image which further gives residual bright and dark details.

III.EXISTING METHODOLOGIES

In existing system, proposed a new feature extraction algorithm based on Independent Component Analysis (ICA) for iris recognition. A conventional method based on Gabor wavelets should select the parameters (e.g., spatial location, orientation, and frequency) for fixed bases. ICA is applied to generate optimal basis vectors for the problem of extracting efficient feature vectors which represent iris signals. The basis vectors learned by ICA are localized in both space and frequency like Gabor wavelets. The coefficients of the ICA expansion are used as feature vector. Then, each iris feature vector is encoded into an iris code. And also presented a private biometrics formulation which is based on the concealment of random kernel and the iris images to synthesize minimum average correlation energy (MACE) filter for iris authentication. Specifically, the training images are multiplied with the user-specific random kernel in frequency domain before biometric filter is created. Another serious problem is that computer users have become too trusting. They routinely use the same password to enter both secure and insecure Web sites as well as their networks at work. In response to the proven lack of security provided by password authentication, network administrators are replacing network passwords with smartcards, biometric authentication, or a combination of the three. Smart cards are credit card-size devices that engender random numbers about every minute, in sync with counterparts on each entry point in the network. Smart cards work well as long as the card isn't stolen. A better choice to ensure network security is the use of biometrics.

IV.PROPOSED METHODOLOGY

Today, biometrics recognition is a common and reliable way to authenticate the identity of a living person based on physiological or behavioral characteristics. It contains unique texture and is complex enough to be used as a biometrics signature. Compared with other biometrics features such as face, sclera and iris is a thin membrane on the interior of the eyeball. It is more stable and reliable, imitation is almost impossible. The iris is unique to people and

patterns of iris are formed by six months after birth, stable after a year. They remain the same for life. Furthermore, iris recognition systems can be non-invasive to their users. The Security has become a main problem of concern among the people. Biometrics is robotic method of identifying a person based on physiological or behavioural uniqueness. Threat starts while a useless person tries to obtain access. A person verification system localizes facial landmarks and extracts biometrical features for face authentication. This includes image acquirement, segmentation, normalization, pattern generation and matching. Automatic sclera and iris recognition system is reliable for automatic personal identification. This research aims to recognize and identify sclera among many that were stored in database. It is includes, after entered eye features, image preprocessing, feature extraction based on texture analysis using HAAR andCurvelet transform to capture both local and global features details in face features and sclera, iris identification (matching process) based on the frequency features the new input iris and templates stored in the database then choose the minimum similarity between them. So the score degree can determine the genuine or imposter person. The database can display information about any processed iris. And also implement Convolutional neural network algorithm to classify the features such as face, Sclera and Iris features. Finally provide alert about known faces. The proposed architecture is shown in fig 2.
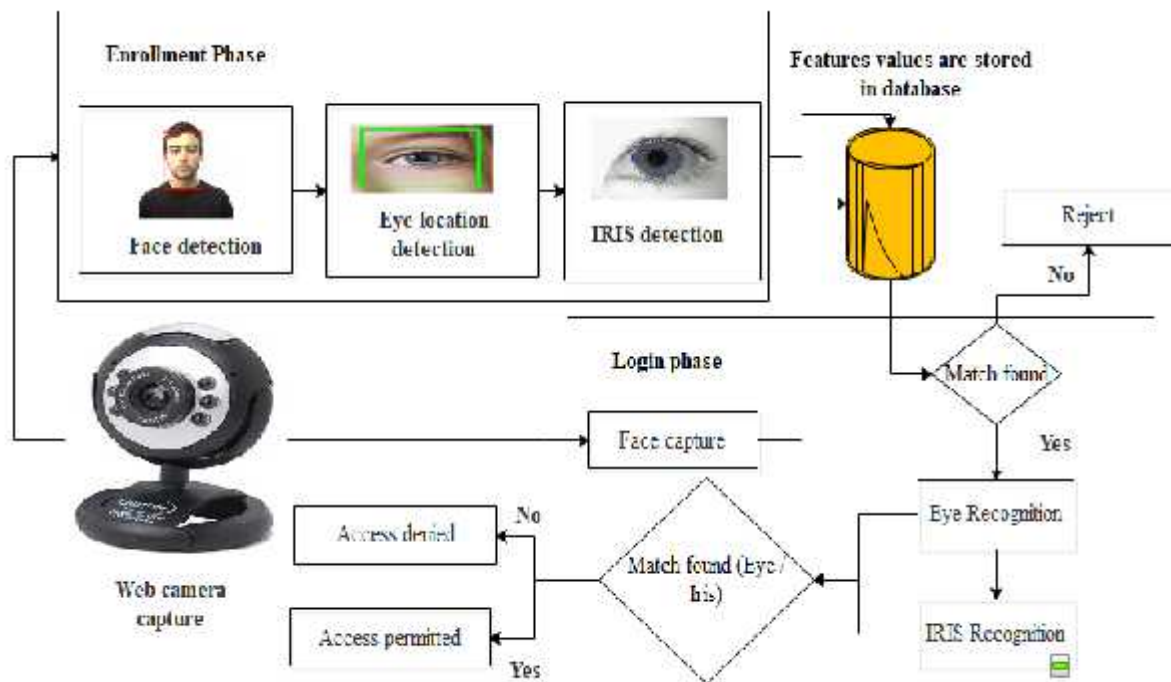

Fig 2: Proposed framework

The proposed layout is derived as follows:

4.1 Enrollment phase:

In this module, user details are register into database. This module is used to admin for entering user features in database. Register the biometric data with their basic details such as name, mail id, mobile number and so on

4.2Image acquisition:

In this module, admin can capture face, sclera, iris images from web camera. First detect the face images using web camera. The images can be type and any size and implement HAAR Cascade algorithmto detect face images. Curvelet transform to detect sclera and iris

4.3Features extraction:

Detect the face boundaries with HAAR Cascade algorithminclude the Skin tone and facial shapes. Extract Sclera and Iris features. Using Curvelet transformalgorithm to extract features. The Curvelet transform is a higher dimensional generalization of the Wavelet transform designed to represent images at different scales and different angles.

4.4.Login phase:

This phase is known as login phase. User can enter into the system using user name and password. After that capture the biometric images from web camera

4.5 Face Recognition:

In this module, capture facial image from web camera. Facial features are calculated using HAAR Cascade algorithm

Sclera or Iris Recognition:

After that, implement curvelet transform algorithm to extract the features. First detect the location of eye and extract the Sclera features. Finally calculate the IRIS features

4.6 Classification:

Extract the features such as face detection, sclera detection, iris detection. These features are matched with data base using classification approach using Neural network algorithm.If there is match found means, user can be register into system, otherwise rejected. The layout of features matching is shown in fig 3.
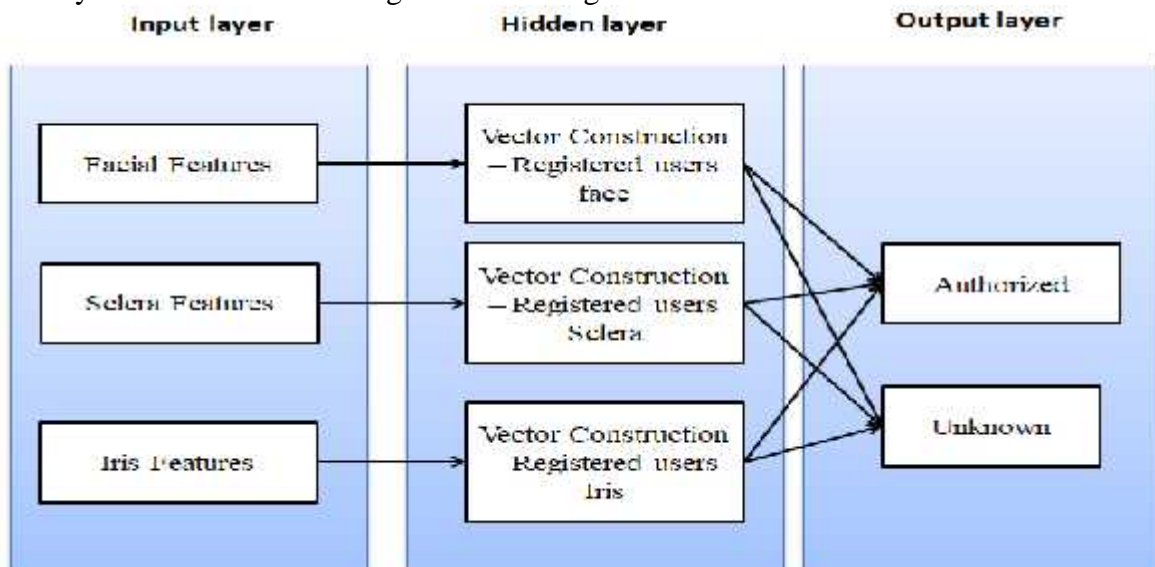

Fig 3: Layout construction

The proposed algorithm efficiently authenticates the biometric features with improved accuracy and implemented in various authentication system.

V.EXPERIMENTAL RESULTS

The proposed work can be implemented as Multi model biometric framework using C#.NET as front end and SQL SERVER as back end. Based on proposed algorithm we can detect the authorized and unauthorized person using Deep neural network algorithms. The experimental results are shown in following figures.

Fig 4: Facial features extraction

Using HAAR cascade algorithm, facial features are extracted as streaming video. These features are stored in database.
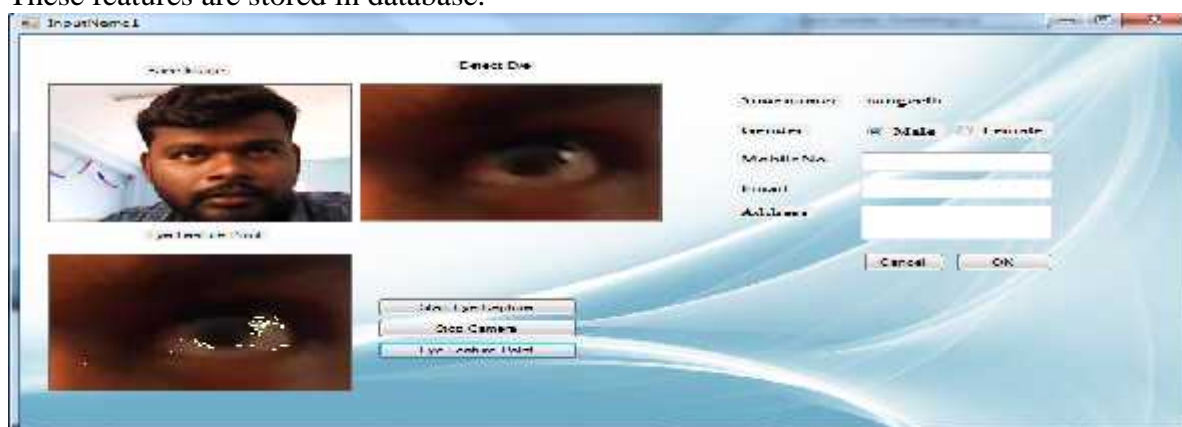

Fig 5: Extract Sclera and Iris features

The sclera and Iris features are extracted using Curvelet transform and match these features using Neural network algorithm

Fig 6: Neural network Classification

In classification stage, features are extracted and matched with database using neural network algorithm.
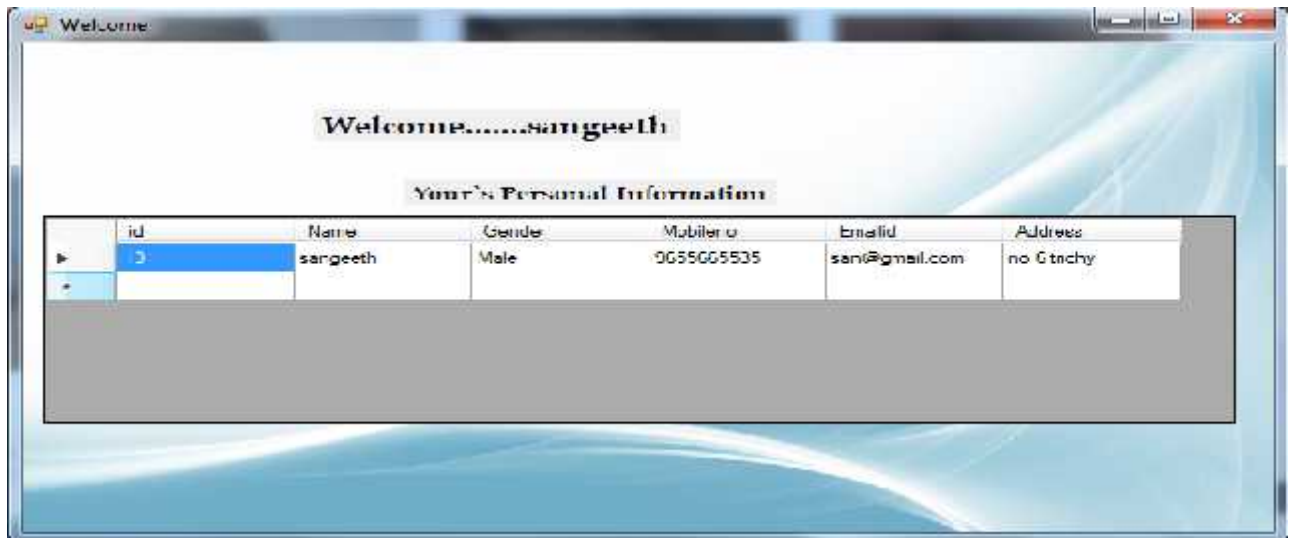
Fig 7: Matched Database

The authentication details are shown in database. The proposed system efficiently authenticate the multi modal features with accuracy

VI. CONCLUSION

This paper proposes an approach for network security by means of biometrics. Biometric systems are commonly used to organize accessing of physical assets such as laboratories, buildings, cash from ATMs, etc., or logical information such as personal computer accounts, secure electronic documents, etc. The human biometrics like fingerprint, hand geometry, face, retina, iris, DNA, signature and voice can be effectively used to ensure the network security. In biometric cryptosystems, a cryptographic key is obtained from the biometric template of a user stored in the database in such a way that the key cannot be revealed without a successful biometric authentication. A proposal algorithm for iris recognition has been presented. Curvelet transform is useful for segmentation of the iris because of efficient localization. The HAAR features has a number of Advantages, it is conceptually simple, fast, memory efficient. In this system, the concept in the areas of image processing technique is reused to extract the minutiae from Iris biometric image. The classification techniques projected in this paper to play an important role in improving the performance of the proposed biometric based network security system. The performance measures obtained exposed that the proposed method effectively provides security. Therefore it can be directly applied to strengthen existing standard single-server biometric based security applications.

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Content-Based Image Retrieval Using Feature Extraction with ANN Algorithm

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Abstract-CBIR or Content Based Image Retrieval is the retrieval of images based on visual features such as colour, texture and shape.Three image features are proposed to index an image, namely, color feature ,shape and bit pattern , which are generated directly from the images related to a query image from a large set of distinct Database encoded data streams without performing the decoding process. Experimental results show that the proposed method is efficient than the block truncation coding image search systems and the other earlier methods.The proposed scheme is not only suited for image compression, because of its simplicity.the query image features are extracted and it compared with cluster after that display the similar images .the proposed idea is to apply the artificial neural networl techniques to increase the accurateness of image retrieval.

Keywords-CBIR,colour,texture,shape,co-occurence matrix.

I.INTRODUCTION:

This Feature Based Image Search (FBIS) is about developing an image search engine, not only by using the text annotated to the image by an end user (as traditional image search engines), but also using the visual contents available into the images it selves. FBIS system should have a database, containing several images to be searched. A FBIS system gets a query from user, whether an image or the specification of the desired image. Then, it searches the whole database in order to find the most similar images to the input or desired image.

CBIR or Content Based Image Retrieval is the retrieval of images based on visual features such as colour, texture and shape. Reasons for its development are that in many large image databases, traditional methods of image indexing have proven to be insufficient, laborious, and extremely time consuming. These old methods of image indexing, ranging from storing an image in the database and associating it with a keyword or number, to associating it with a categorized description, have become obsolete. This is not CBIR. In CBIR, each image that is stored in the database has its features extracted and compared to the features of the query image. It involves two steps:Feature Extraction: The first step in the process is extracting image features to a distinguishable extent.Matching: The second step involves matching these features to yield a result that is visually similar.FBIS operates on a totally different principle, retrieving stored images from a collection by comparing features automatically

extracted from the images themselves. The commonest features used are mathematical measures of color, texture or shape.
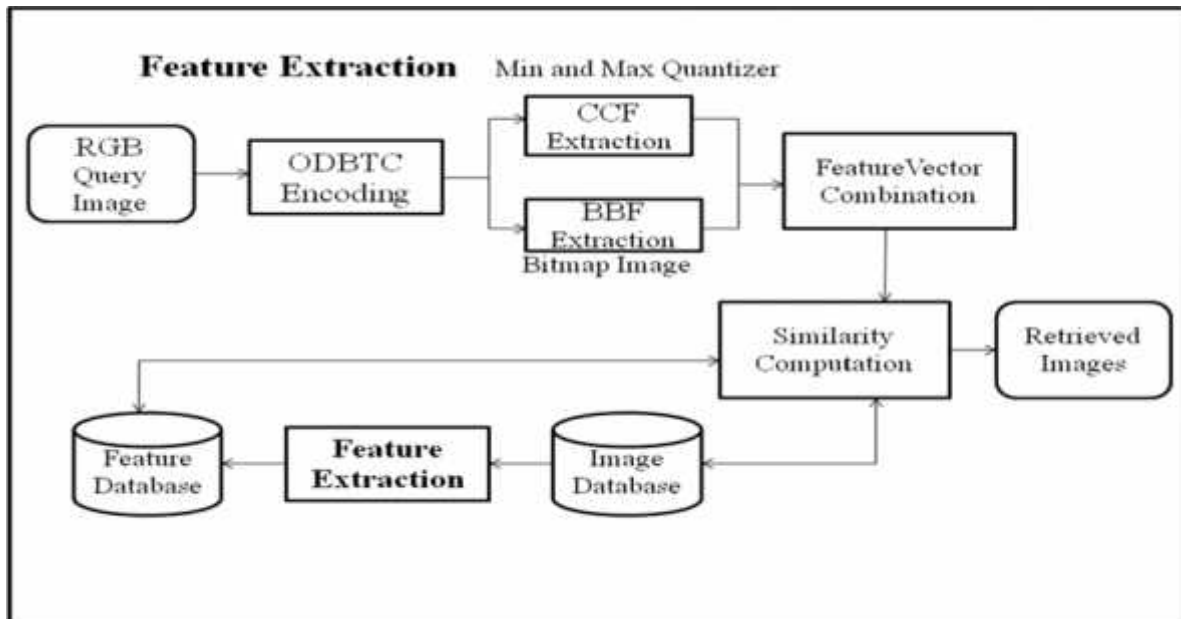
System Architecture

II.ALGORITHM

Two image features are proposed to index an image, namely, color co-occurrence feature (CCF) and bit pattern features (BPF).The CCF and BPF of an image are simply derived from the two quantizers and bitmap, respectively.

2.1Color Co-Occurrence Feature [CCF]

The color distribution of the pixels in an image contains huge amount of information about the image contents. The attribute of an image can be acquired from the image color distribution by means of color co-occurrence matrix. This matrix also represents the spatial information of an image. Color Co-occurrence Feature (CCF) can be derived from the color co-occurrence matrix.

2.2 Bit Pattern Feature [BPF]

BPF characterizes the edges, shape, and image contents. The binary vector quantization produces a representative bit pattern codebook from a set of training images.

2.3Artificial Neural Network[ANN]

- The proposed ANN consists of 5 input neurons they are color, texture, shape, mean and standard deviation.

- The number of hidden neurons used in the ANN is 10 and single output neuron. The procedure for training and testing of the hidden neuron is given below.

- The proposed ANN is called the feed forward neural network, consist of 5 input units, one output units, and M hidden units (M = 10).

- First, the input data is transmitted to the hidden layer and then, to the output layer.

- Each node in the hidden layer gets input from the input layer, which are multiplexed with appropriate weights and summed.

III. MODULES DESCRIPTION

There are four modules using in this project,

3.1 Database Creation Module

In database creation we have to create the database of all images which we are going to stores. These images are based on the common nature images. in these we are storing images in database of mat lab folder for future image search

3.2 Image To Pixel Creation Module

In image to pixel creation we are going to convert that image into pixel format and each pixel of the image going to convert into gray scale value. Based on the grey scale value only the image was classified into separate categories.

3.3 Color Co-Occurrence Feature Extraction Module

In color co-occurrence feature category we are going to extract the RGB Based features of image and those RGB based features will varies for every image. The color distribution of the pixels in an image contains huge amount of information about the image contents. . The attribute of an image can be acquired from the image color distribution by means of color co occurrence matrix.

3.4 bit Pattern Features Extraction Module

Bit Pattern Feature(BPF), characterizes the edges, shape, and image contents. The binary vector quantization produces a representative bit pattern code book from a set of training bitmap images obtained from the ODBTC encoding process.

IV.OUTPUT SCREENSHOT

V.CONCLUSION

The choice and the representation of the visual features when building FBIS systems in addition to the similarity measurements are two important tasks. We implemented a FBIS system based on multiple features representations include: feature, bit pattern and the color layout feature. The experiments showed that the cosine similarity distance gives good results when combining feature and color while the best search accuracy is obtained when adding the color layout feature to the combination of color and texture features but based on the Euclidean distance. The results demonstrated the importance of using the spatial information beside the color feature itself, and the importance of the similarity measurements when enhancing the performance of Feature Based Image Search systems.

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Sec Fish-A Smart Fishermen Device

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Abstract - The sea frontier between the countries is not easily recognizable, which is the critical reason for the cross-border cruelty. The main aim is to caution the fishermen when they go across the International Marine Time Boundary Line (IMBL). The location of the fishermen is obtained by the Global Positioning System (GPS) and Global System for Mobile communications (GSM). Using GPS, we can detect the live latitude and longitude values and it is dispatched to the microcontroller unit. Then the controller unit discovers the current location by comparing the present latitude and longitudinal values with the predefined value. Then, from the result of comparison, this system alerts the fishermen that they are about to reach the maritime border. The fishermen's boat status is updated for *every 30 seconds and the information is passed to the border security force. If the fishermen tend to cross the boundary, an alert message is displayed using a Liquid Crystal Display (LCD). The system is equipped with an emergency button for the fishermen to communicate with the border security force.*

Index Terms— **International Marine Time Boundary Line, GPS, GSM, Arduino.**

I. INTRODUCTION

On a daily basis, we hear about problems faced by Indian fishermen who are captured by the neighboring countries because of crossing the nautical border. It is a considerable issue and the fishermen's fatality rate keeps increasing. This system comes with a consistent solution for the problem and secures the Indian fishermen from the hazardous situation and prevents them from crossing the boundary.

It protects their livesand decreases the fear of being prisoned. GPS is a device that exactly discovers the safe zone by getting data from GPS satellites. The data is tracked by the GPS every 30 seconds and it is updated to the coastal guard for them to have an eye on the fishermen for safety purposes. If the fishermen tend to cross or move out of the safe zone, buzzer goes on and warning message is displayed. The fishermen are also warned about typhoon and they can ask for help when they are confronted by some issues using an emergency button which is furnished in the boat.

II. RELATED WORKS

In the previous workings, only GPS is used to receive the information from the satellite and stored border locations are used to detect whether the boat has crossed the border or not. To alert the mariner, the message is transmitted to nearby coast office through RF signals at VHF (30-300MHz) range [1].

GPS is used to find the location of the boat. When it further nears the boundary, an interferer is sent to the Engine Control Unit which controls the speed of the engine with the help of the electronic fuel injector [2].

DGPS system is attached to the boat which in turn is connected to an alarm device. The DGPS receives the topographic location of the boat in the sea and then triggers an alarm if the border of the country is crossed by the boat. Topographic location of a country's border can be obtained with the information of the latitude and longitude of the place and position of the boat. [3]

III. PROPOSED SYSTEM

In this proposed system, the GPS device will precisely give the signal which regulates the latitude and longitude to indicate the spot of the fishermen. The specific layer i.e. the perimeter can be predefined and this can be accumulated in microcontroller memory. The current latitude and longitudeare compared with predefined values and if these values are similar, the microcontroller gives command to the buzzer to ring. It also sends message to the base station which monitors the boats in the sea.

The system provides an indication to both fishermen and to coastal guard. Thus, it saves the lives of the fisherman and alerts the base station to provide help. Furthermore, to monitor fishery activities the location of the boat will be updated in the cloud for continuous interval. The web server controlled by the coast guard can warn the boat whenever there is a fault in weather or any nearby stress or disturbance. Also, the boat can send any emergency via a button click to the server. For connection between the boat and server GSM module will be working as GPRS modem. Thus, continuous location sharing, emergency stress message and help to nearby boat can be done in a swift manner.

IV. SYSTEM ARCHITECTURE

The latitude and longitude of the fishermen is fetched by the GPS and it is sent to the coastal office. As the border locations are predefined, fishermen are warned when they go near the nautical border. The warning message is displayed in the LCD and the buzzer starts to ring.There is a two-way communication between the fishermen and the coastal office. In case of emergencies, the fisherman can send their location by clicking the emergency button. The fishermen are also alerted when there is typhoon or if their neighbour is in trouble. For the GPS to function effectively, SIM808 is integrated with high performance GPS/GPRS engine. The power supply range of SIM808 is from 3.4V to 4.4V. The system architecture is demonstrated in fig.1
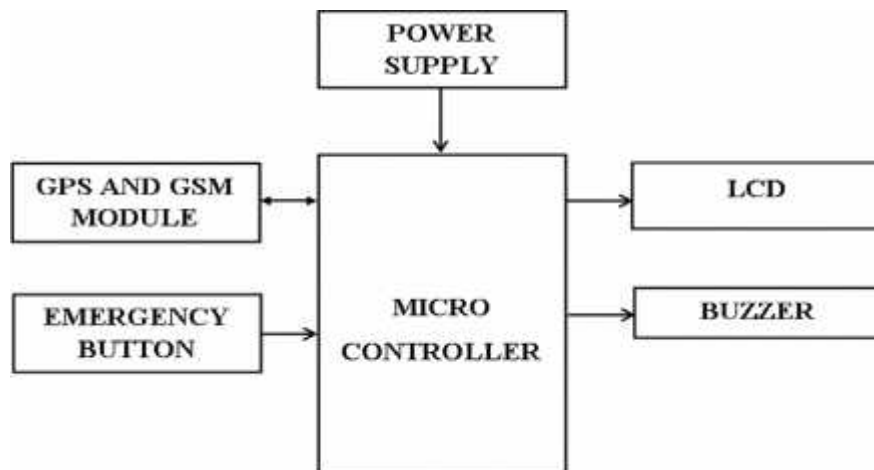

Fig.1 Proposed System Architecture

4.1 GPS

The main aim of the GPS system is to guarantee continual monitoring of each boat and the information is given to the coastal office. The Global positioning system basically consists of two parts: Transmitter and Receiver. The transmitter's job is to track the location with the help of information from satellite. The satellite information is taken and this is sent to the receiver where the exact longitude and latitude of the place is found. GPS units receive signals from United States Government satellites that they use to determine location. Depending on the unit, a GPS can point your place in three dimensions—latitude, longitude and altitude.

GPS receiver measures the signal transit time between the point of observation and four different satellites whose positions are known. Each satellite transmits its exact position and precise on-board clock time to earth at a frequency 1575. 42 MHz These signals are transmitted at the speed of light (300,000 km/sec) and therefore require approximately 67.3 m/s to reach a position. [4].
In order to make this simple calculation, the GPS receiver has to know two things:

i. The location of at least three satellites above you.

ii. The distance between you and each of those satellites.

4.2 GSM

GSM (Global System for Mobile communication) is a cellular technology used for transmitting mobile voice and data services. GSM module is utilized for transmission of message looking for help. The GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. Out of all cell technologies in use today, GSM is the most widespread [5]. However, it is important to know that although GSM is currently the industry standard in cell technology. The GSM based networks (i.e. base stations) are deployed across the world and hence same mobile phone works across the globe. This leverages cost benefits as well as provides seamless wireless connectivity. This will help users avail data and voice services without any disruption. When boat crosses the border, the stored message adjacent to with compared position and the message is sent to the desired authority person by GSM module. The MODULE OF GSM is depicted in the Fig.2

Fig.2 Module of GSM

4.3 ARDUINO

Arduino boards sense the environment around them as they receive input from sensors connected to the analog and digital inputs [6]. They can also control actuators such as motors, alarm sounders and electric valves, or switch on LCDS, lamps or other visual indication devices.

An Arduino development board will have at least:

- 9 digital pins which can be either input/output channels. Some of these can be setup as PWM (Pulse Width Modulation) outputs. A PWM signal is a square wave whose pulse width can be varied. PWM is used for speed and position control of motors and serves in robotics and remote-control applications

- 4 analog input channels.

- At least one serial port which may also be used for download of code to the Arduino.

The Arduino microcontroller is shown in the fig.3. A liquid-crystal display (LCD) is a flat-panel display that uses the light-modulating properties of crystals. LCD is used to display the warning messages such as neighbour in alert, weather issue alert and also emergency alerts. The latitude and longitude details are also displayed for verification purposes.
Figure 4 is a LCD display.

Fig. 3 Arduino Microcontroller

V. RESULT ANALYSIS

The fatality rate has been shown in the fig.5. The fishermen can easily identify the national sea borders and their locations are instantly updated to the coastal office. Emergency alerts are sent to fishermen and it is displayed using the LCD. This method gives sufficient information to both fishermen and border security force and provides an efficient broadcasting of border crossing and emergency alerts. The SEC device is shown in fig.5 and the storing of locations in the cloud is shown in fig.6.

Fig.5 TamilNadu Fishermen death rate graph

Fig.6 SEC device   **Fig.7 storage of locations in the cloud**

VI. CONCLUSION

Thus, the fishermen can simply distinguish the national sea borders and therefore avoid entering other country. The proposed paper requires low-cost. The project aims at providing tranquillity at the borders and reduces the pressure of the fishermen. The system proposed will not only alert the fishermen but also carries information to the control station. The architecture is trustworthy and steady. In case the boat is extinct due to rough conditions of the sea, then the information is instantly sent to the border security and the mandatory action is taken.

VII. FUTURE WORK

To make it more efficient, the activity of directing the fishermen can be enhanced by placing the engine control unit in the coastal office. They remotely control the engine to restart the boat for the welfare of the fishermen.

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A Dynamic Web Content Reader Application For Low Vision Patients Using Python

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Abstract— With six meters highest visibility and 20 degrees maximum wide view, people who suffer from low vision are unable to see words and letters in ordinary newsprint. This fact makes the reading process becomes difficult that can disturb the learning process and slow the patient's intellectual development. Therefore, an application is needed to help them read easier. The challenges faced by visually impaired people in reading printed text in their day-to-day life are often not well understood. This project is based on a prototype which helps the user to listen to the contents of the live websites in Tamil, English, and Hindi etc. It involves the extraction of content from the websites and translates audio output in the languages mentioned above. This is done using python libraries with the concept of Natural Language Processing, Web Mining, Text-to-Speech. It is portable and easy to use thus providing a better reading experience to the visually challenged people as enjoyed by their sighted peers.
Keywords—Text-to-speech; Python libraries; Natural language processing; Web Mining; Visually impaired;

I.INTRODUCTION

The complexity of the existing Braille system for the visually impaired people is that it requires the text to be translated to Braille literature. Translating a book or a document into Braille literature is a complex, time consuming and more expensive process. Day-to-day information cannot be translated into Braille literature. To ease this process of reading for the visually impaired people, this prototype has been proposed. Using this prototype, text information can be converted into its equivalent audio format. This is done using python libraries with the concept of Natural Language Processing, Web Mining, Text-to-Speech. It is portable and easy to use thus providing a better reading experience to the visually challenged people as enjoyed by their sighted peers.Remaining section describe about Existing System and Proposed System.

II.EXISTING SYSTEM

The Existing system done by integrating camera module and speakers to Raspberry Pi 3 model B which is a credit card sized single board computer. Also, two other software called Tesseract and TTS engine (Text to Speech synthesizer) is installed to the Raspbian OS. Principally, the camera captures the image and stores it as an image file with a .jpg extension. The OCR engine converts it from image file to text file by extracting the numbers and

characters of the language. The file is given as an input to a python program which gives a translated speech output using Google text to speech engine.
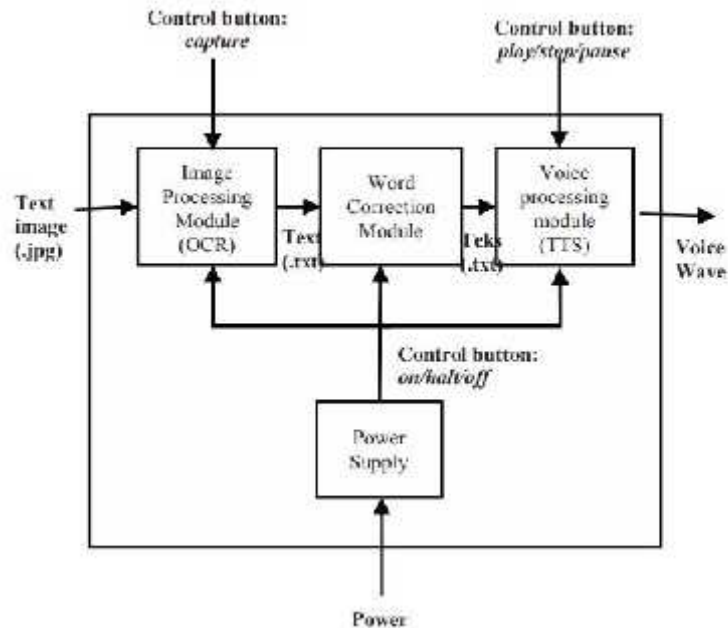

Fig. 1. Block Diagram of Text-To-Speech Device

Text-to speech device consisted of three main modules, the image processing module, word correction module, and voice processing modules. Image processing module sets the object position, focus and illumination camera, taking pictures, and converting the image into text. Word correction module makes corrections to the output image processing module to improve accuracy by matching with Indonesian dictionary. Voice processing module changes the writing into sound and process it with specific physical characteristics so that the sound can be understood.

The input image captured by the camera has a size of 5 MPI (2592 x 1944 pixels) or 215 ppi(pixels per inch). Based on the specifications of the Tesseract OCR engine, the minimum character size that can be read is 20 pixels uppercase letters. Tesseract OCR accuracy will decrease with the font size of 10pt.

The image is taken by the user via GPIO pin that are connected to the tactile key using interrupt function. Furthermore, the picture is taken by using raspistill program with sharpness mode to sharpen the image. The resulting image has a .jpg format with a resolution of 2592 x 1944 pixels.

Word correction module gets input from the image processing module in the form of text from the image processing module. Image processing module can't define truth or falsity of the word output, so that the correction module of this word, correction for whole words output from the image processing requires module. In order to improve the accuracy of the output image processing module, to design the word correction module.

The main *disadvantage* of the existing system is highly expensive. And the portability of the Device is very difficult. The Existing system using only converts the printed content. Also, the capturing paper size is A4 only. The Device Takes more time to convert the scanned Documents. If any problem occurred in the specific part of the device, it will affect the total setup.

III. PROPOSED SYSTEM

The complexity of the existing Braille system for the visually impaired people is that it requires, the text to be translated to Braille literature. Translating a book or a document into Braille literature is a complex, time consuming and more expensive process. Day-to-day information cannot be translated into Braille literature. To ease this process of reading for the visually impaired people, this prototype has been proposed. Benefits of the visually impaired are not necessary to learn any new language. The visually impaired can easily understand because different languages converted into native languages and hearable audio output. In the Proposed system, all external devices are avoided. In the Existing System, only can convert specific languages like Tamil and English. But in the proposed system, establish multiple conversion of languages like English, Arab, Japanese, French etc. In the Proposed System, convert the dynamic web content using web mining and Natural Language Processing concepts. It is easy to use and portable. All kind of people can use this application. And content can easily understand by the visually impaired persons also other language peoples are able to understand the different languages in our native languages.

IV. DESIGN AND IMPLEMENTATION

Our designed Project is called Web Reader, a simple application with the text to speech functionality. The system was developed using web mining and NLP concepts using python.

The application is divided into three modules - the main application module which includes the basic GUI components which handles the basic operations of the application such as input of parameters for conversion either via file or direct keyboard input.

The second module, Requesting the targeted website using urllib to fetch by using GET method and read the content as object (page as Object). Separate content from DOM object by using bs4 and find the targeted object.

The third module, Converting DOM object as a string. Parse string to the textblob. Finally Set output language & store in array(language conversion) and loop the string converted to audio. Web Reader converts Dynamic web content to Audio output in native Language in the application. It provides multiple language conversion into native language. Web Reader loads the content from the website and the Language Conversion procedure starts automatically.

Web Reader contains an exceptional function that gives the user the choice of saving its already converted text to any part of the local machine in an audio format; this allows the user to copy the audio format to any of his/her audio devices, so that they can hence forth treat it as an audio book.
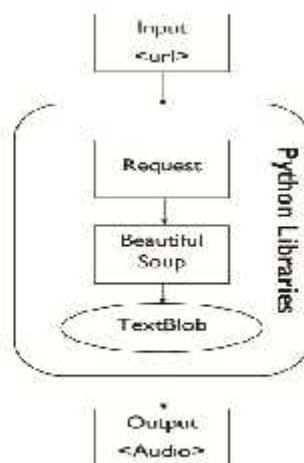

Fig. 2. Block Diagram of Dynamic Web Content Reader

The fig.2 is the block diagram of the Web Reader Application. This diagram shows the flow of the Web Reader Application. The user can give the prefixed URL input to the Web Reader Application. And the python libraries like requests, bs4, textblob are processed the URL and retrieve the specified web content from the given particular URL. And the retrieved web content is converted into the audio(.mp3) format in native language Tamil.
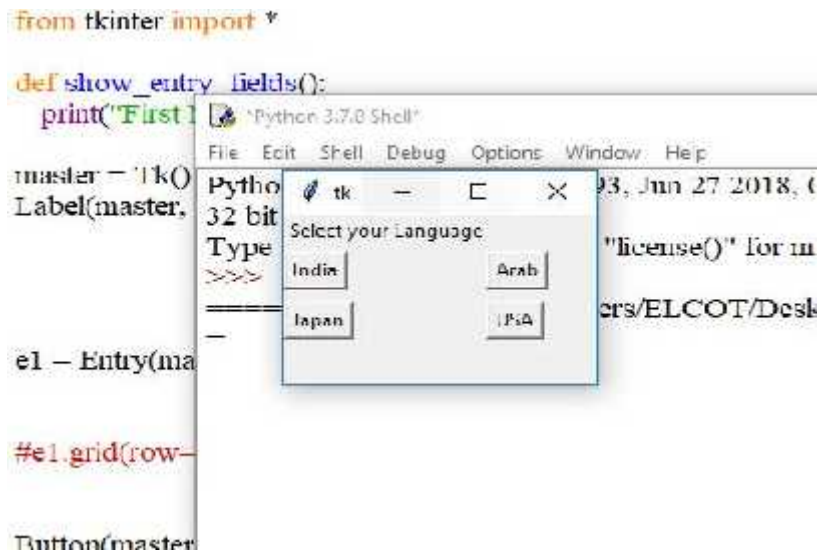

Fig. 3. sample output for Web Reader Application.

The python library requests, bs4, textblob, gtts, pydub, lxml, os are used in our project. The detailed explation of each library is followed by,

requests— Requests will allow you to send HTTP/1.1 requests using Python. With it, you can add content like headers, form data, multipart files, and parameters via simple Python libraries. It also allows you to access the response data of Python in the same way.

bs4— BeautifulSoup 4. Beautiful Soup is a Python library for pulling data out of HTML and XML files. It works with your favorite parser to provide idiomatic ways of navigating, searching, and modifying the parse tree. It commonly saves programmers hours or days of work

textblob— *TextBlob* is a Python (2 and 3) library for processing textual data. It provides a simple API for diving into common natural language processing (NLP) tasks such as part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more.

gtts— gTTS *(Google Text-to-Speech)*, a Python library and CLI tool to interface with Google Translates text-to-speech API. Writes spoken mp3 data to a file, a file-like object (bytestring) for further audio manipulation, or stdout. It features flexible pre-processing and tokenizing, as well as automatic retrieval of supported languages.

pydub— Manipulate audio with an simple and easy high level interface.

lxml— The lxml XML toolkit is a Pythonic binding for the C libraries libxml2 and libxslt. It is unique in that it combines the speed and XML feature completeness of these libraries with the simplicity of a native **Python** API, mostly compatible but superior to the well-known ElementTree API.

OS— The OS module in Python provides a way of using operating system dependent functionality. The functions that the OS module provides allows you to interface with the underlying operating system that Python is running on – be that Windows, Mac or Linux.
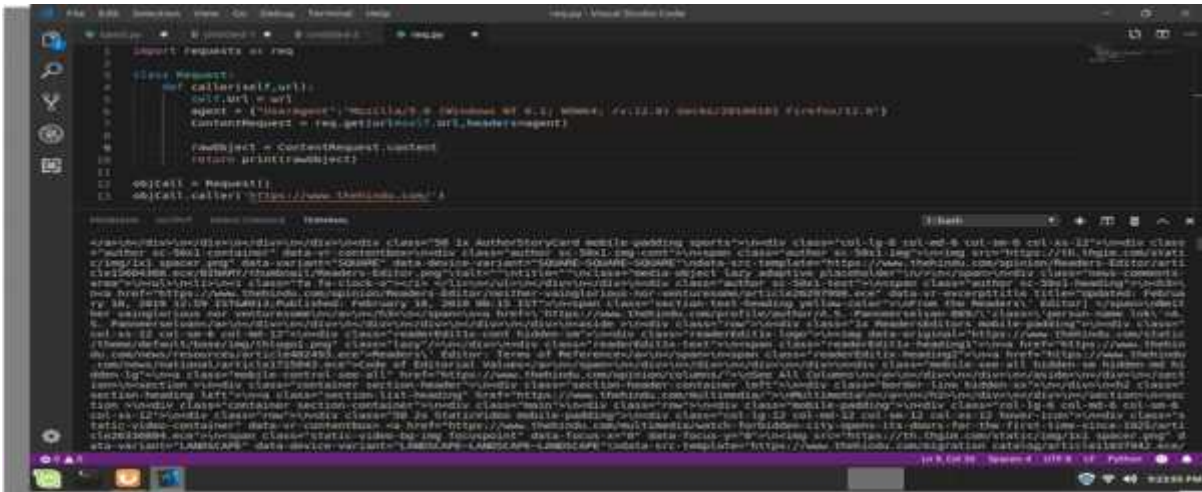
Fig. 4. sample output for requests library

The Requests library used to Requesting the targeted website using urllib to fetch by using GET method and read the content as object (page as Object). Separate content from DOM object by using bs4 and find the targeted object.
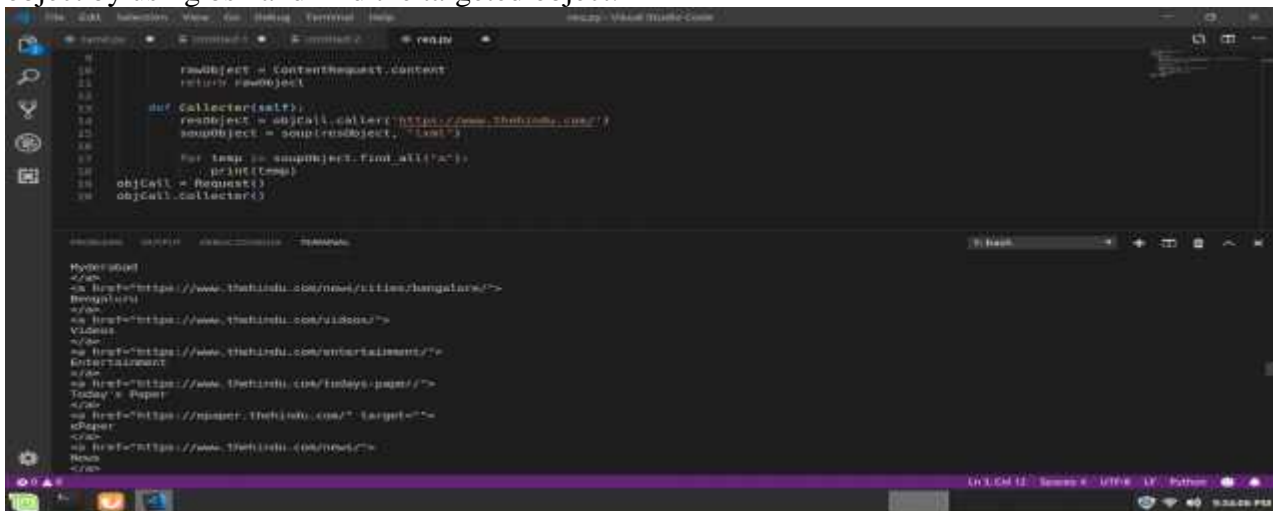

Fig. 5. sample output for bs4 library

The bs4 library is used to Converting the DOM object as a string. The converted string as given to the texblob library it's convert the text input to audio(.mp3) format output.
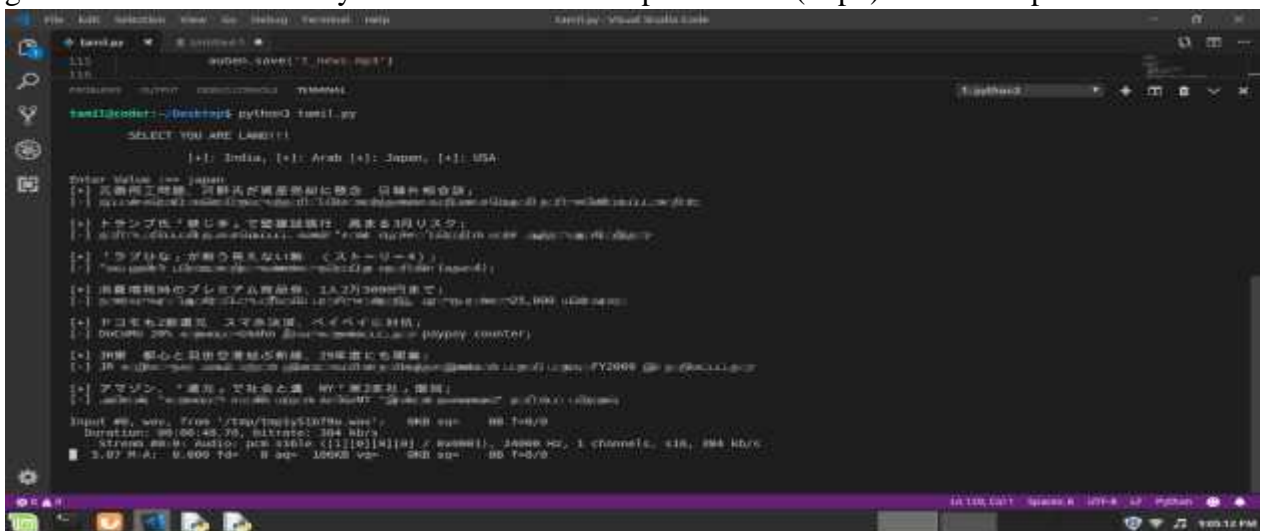
Fig. 6. sample output of the Web Reader Apllication

Initially four languages (India-English, USA-English, Arab, Japan) are converted into native languages and in future many language's can be converted into native language.

V.CONCLUSION

Web Reader Application is a flexible robust dynamic growing aspect of modern computer era and it is increasingly playing a more significance role in the way we interact with the system and interfaces which is based on platform independent concept. We have identified the various operations and processes involved in text to speech synthesis. We have also developed a very simple and attractive graphical user interface which allows the user to choose the language in the application. Our system interfaces with a text to speech engine developed for Arabic, Japanese, English. In future, we plan to make efforts to create engines for conversion of one language to other make text to speech technology more accessible to a wider range. Accuracy of the software is excellent in the context of its ability to work in real-life environment. We also have plans to make it a web based real-time synthesis system, so that its uses can get more expanded.

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Providing A Smart and Dynamic Optimal Solution for Bus Scheduling

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Abstract - The scheduling of buses in a manual way is quite difficult and time-consuming process. And though obtaining specific and optimal bus routes is not efficient in real time. Therefore, we intend to provide dynamic scheduling for the buses in an automated way. To illustrate the dynamic scheduling, the primary task is to collect the bus routes and **passengers' details. Using SQL Dat***abase, a database is maintained to stores the details of the passenger. A GUI Form is enabled to retrieve the data and display on the form. A pattern is maintained for a major boarding point which covers different routes. Based upon passengers boarding point, we would match their boarding point with the pattern and provide the optimal covering route which is displayed on top of the GUI Form using Windows Builder (Eclipse). When the administrator enters the number of passengers, the best matched routes are provided. With the Eligen algorithm, the best routes are scheduled and the administrator can allocate the optimal routes for the specified passengers.*
IndexTerms—**SQL Database, Windows Builder (Eclipse),Eligen Algorithm.**

I. INTRODUCTION

Bus scheduling is the basis of security and efficiency for various bus enterprises. It is necessary to take into account the passenger travel demand to meet both the social and economic benefits for these bus enterprises. In the recent years, research has been done to develop optimization models that will increase bus passenger convenience and, on the side of bus management, minimize unnecessary bus operation. The main problem faced in bus scheduling is the number of passengers and their depots.

This paper approaches to use an Eligen Algorithm for scheduling of buses. The modeling of bus scheduling problems is considered to optimize the number of buses and their scheduling in the city. The Vehicle Scheduling Problem (VSP) can be solved by some heuristic algorithms. The disadvantage of these algorithms is that the solution quality decreases as the number of depots increases. Therefore, in this paper, we develop the Eligen-algorithm, which uses the techniques of column elimination and column generation, for solving the MultipleDepot Vehicle Scheduling Problems (MDVSPs). The advantage of this algorithm is that the solution quality improves as the number of depots grows. Moreover, this algorithm is faster and gives better solutions than the Nearest Bus-stop heuristic algorithm (NB) and the Joined Nearest Bus-stop heuristic algorithm (JNB) which we developed before.

II. LITERATURE REVIEW

ChotirosSurapholchai, Gerhard Reinelt, and Hans Georg Bock" Solving City Bus Scheduling Problems in Bangkok by Eligen-Algorithm". This paper deals with the Eligen-Algorithm that uses combinatorial optimization techniques between column generation and column elimination methods. The main advantage is that the quality improves as the number of depots grows and provides faster and better solution. The main disadvantages is that this algorithm can save the number of vehicles for all MDVSP.

Kevin A. Kettler, John P. Lehoczky, and Jay K. Strosnider "Modeling Bus Scheduling policies for real time systems". This paper deals with concepts of fixed priority, hybrid bus scheduling process and Round Robin that can be implemented in bus scheduling process. The main advantage is to improve designer for real time traffic and it helps to choose the best scheduling process. The disadvantage is that the parameters may affect the efficiency of scheduling process.

Franz J. M. Salzborn "Optimal Bus Scheduling". This paper deals with the mathematical investigation used for single and multi-routes and Calculus variation technique is used to determine fleet size formula. The advantage is that the actual peak time and optimal allocation of seats for passengers are determined. The disadvantage is that it cannot produce efficient results for multi routes through linked buses.

R. D. Angel, W. L. Caudle, R. Noonan, A. Whinston, "Computer assisted school bus scheduling". This paper deals with Travelling salesman solution is applied to minimize the routes. The advantage is to provide the number of routes that are minimized and no bus is overloaded. The main disadvantage is that to provide solution for large routes.

J. L. Saha "An algorithm for Bus Scheduling Algorithm". This paper deals with the ordering Relationship to verify the acyclic routes, Linear programming method for maximum and minimum chain decomposition. The advantage is that the equivalence of linear programming problem solved by simplex method and designed in bipartite graph. The disadvantage is that the time-consuming nature of labelling algorithm leads the process to be very slow for large bus scheduling algorithm.

III. PROPOSED MODEL

The website creation in scheduling of buses had been done by four modules which are proposed into the system. To optimize and provide and final output, the proposed work suggests the way to establish flow of working process into the system.
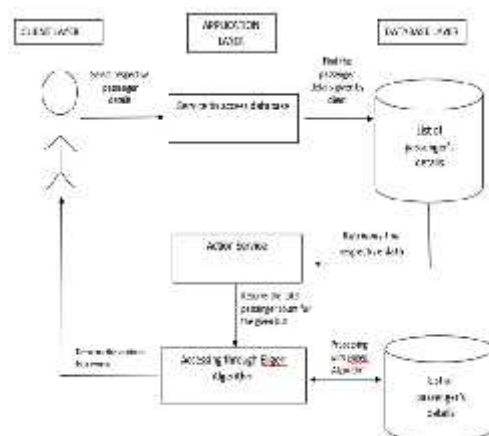

igure 1: work flow of proposed system

Initially, the application prompts the user to provide the input i.e., checklist of students according to year wise. This module starts with the collection of passengers record such that their register number (primary key), Route number, Covering routes which are stored in database.

Second module is to access the database, the user input is used for displaying the total strength of passengers can be developed by SQL query to retrieve the passenger record along with routes.

Third module enables the application to display the route and the count of passengers in each route which segregates the passenger details according to their respective routes and boarding points with route number.

Finally,theEligen algorithm which is used to schedule the displayed routes to optimize the maximum number of buses to particular routes and provide minimum number of buses to specific routes to avoid traffic and pollution.

Thus the application has been developed according to the proposed framework which generally instructs the user to analyze the model and database.

IV.SYSTEM ARCHITECTURE

The architecture diagram shows the levels of application execution in three layers such as Client layer, Application layer and Database layer.

The Client layer is the user input layer which is the front end of the application prompts the user to provide the input which then supposed to enumerate into application to process with scheduling concept for getting an optimal bus routes.

The intermediate layer is the Application layer which acts as the interface between user and the database. It has the services to access the database to retrieve the passenger details according to user input. This layer consists of Java and JSP code to communicate to database layer to perform action services retrieved from database. It has the concept of Eligen algorithm which schedule the maximum number of routes into an optimized routes.
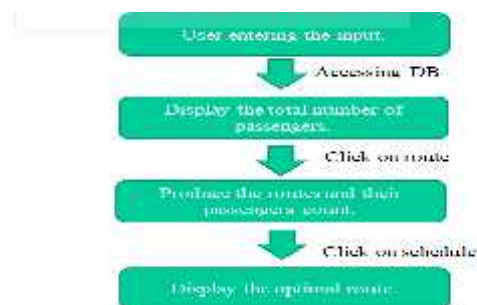

Figure 2: Bus Scheduling System Architecture

The Database layer also called as Backend of the application has the repositories which holds the collection of passenger details and their data source are subjected from

analysis each passengers according to register number, route number and it's covering routes in SQL database.

The level splitting of application developed using Java EE framework which acts as platform to develop the website for user access in easier and understandable way. The architecture design describes the blueprint of proposed work of bus scheduling concept in abstract way.

V. RESULT ANALYSIS

The simulated results show the easy interaction between the user. The below starting page of the form gives to move to next pages by one click.

F **igure 3: Starting page of the Form**

Then, the user can click the total passengers' details and to click on the total count. And the total count gets displayed on the form.
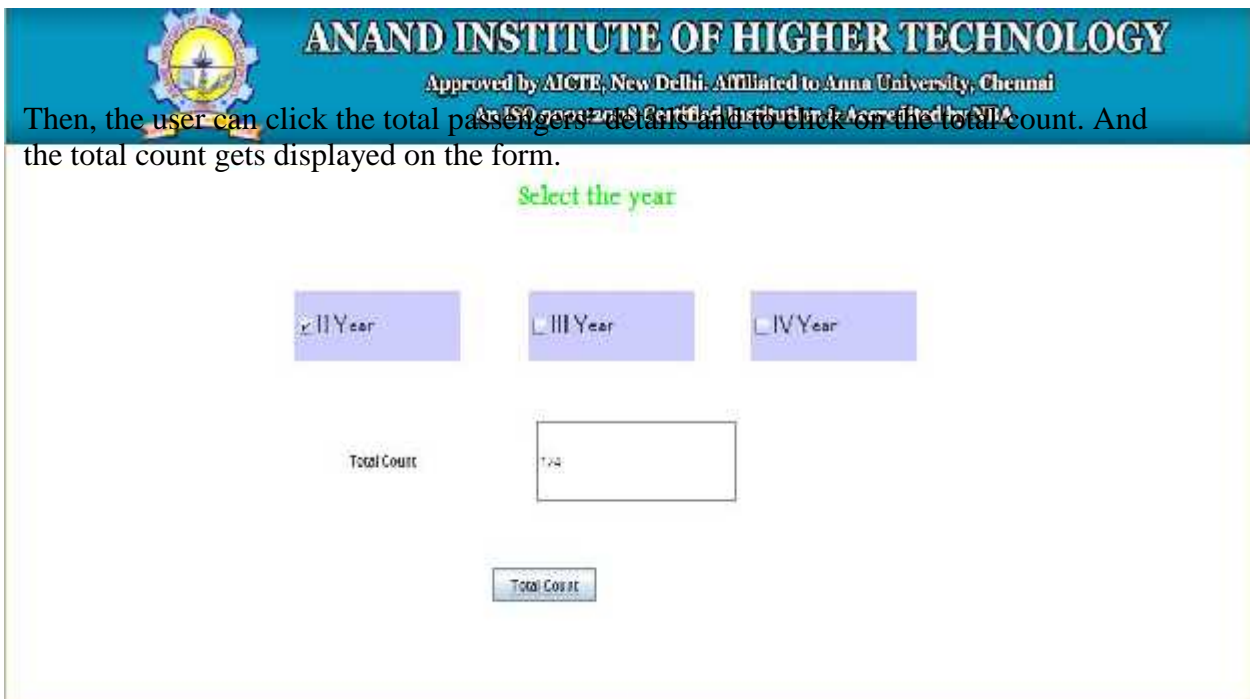
Figure 4: Total number of passengers displayed for the selected year

In the next page, the bus route and their respective count

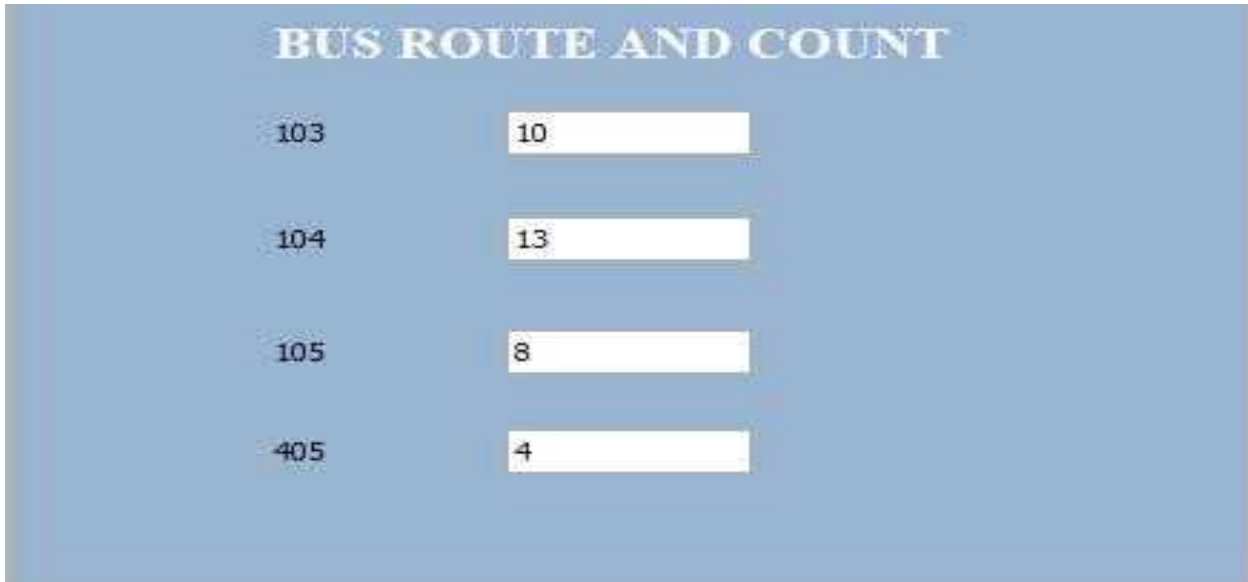are displayed for the convenience to allocate the optimal bus routes.

Figure 5: Bus Route and their count

VI. CONCLUSION

This form is very efficient and helpful for the bus administrator who want to allocate optimal bus routes with the available data. This way helps to reduce the number of buses based on the passengers count. And transport system is used efficiently to reduce cost and time. The database should be updated each time for each year. Using SQL Database, the data can be easily retrieved and displayed. The future work may be to find the optimal bus routes for the scheduled buses in more efficient way and also create an attractive GUI-enabled form.

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Implementing WAN Services in Software Defined Networks with Open APIs

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Abstract -For desired wide area network (WAN) connectionscloud applications require the ability to customize bandwidth and network policies. But, In Virtual Private Network (VPN) is difficult to provide this ability. Software-Defined Network (SDN) creates the opportunities to provide this ability. In this paper, we design Grace, a SDN-based system to provide diverse connections with flexible bandwidth and customized policies, implementing WAN as a service. Grace provides the ability to customize WAN connections without policy conflicts, allocates required bandwidth optimally, translates them into low-level configurations for underlying network devices, and successfully deploys WAN in a short time.
Index Terms—Soft-defined network (SDN), wide area network (WAN), bandwidth allocation, policy conflict.

1. INTRODUCTION

WIDE area networks (WANs) connecting datacenterslocating in different places become an indispensableinfrastructure in cloud applications.Many applications, providing on-demand computing and storage resources, rely on lowlatencyinter-datacenter communications or high-throughputtransfers. These applications result in rapid growth in interdatacentertraffic, and significantly increase the bandwidthrequirements of WAN. Given such huge demands, serviceproviders (SPs) have to charge hundreds of millions of dollarsfor Gbps traffic rate in WAN.   However, even high investment is still unable to cope with the ever-changing requirements. First, networks interconnecting multiple datacenters are diverse. Second, the bandwidth demands are continuously changing in the WAN connections, an thusthe ability to provide flexible bandwidth configurations is necessary.

Virtual private network (VPN) as an important network technology, provides WAN connections over the public networkinfrastructure. However, it has several main problems unsolved.First, applying for VPN services is a time-consumingand complicated process.Second, although VPN provides end to-end connections through manual installation, it is difficultto establishdiverse connections such as interconnecting multipledatacenters in a short time. Third, achieving on-demandbandwidth allocation requires frequent changes of

networkconfigurations.Fourth, network polici are required in VPN services, and configuring them often needs network operators tomanually install rules intocorresponding devices.

As mentioned above, cloud applications require on-demandWAN services to provide desired connections, on-demandbandwidth and customized network policies. However, SPsare unable to flexibly schedule infrastructure resources (e.g.,bandwidth) since they have no ability to globally manageand orchestrate the network. Fortunately, the appearance ofSoftware-Defined Network (SDN) decouples the controland forwarding planes, and exploits logically centralized control,which helps to open these network capabilities to upperlayerapplications.

Therefore, associating with underlying SDN infrastructure,we design user-centric APIs to provide the following features.

1. Abstraction of Network Connections. The WAN connections differ due to user demands, which may be multi-site (e.g., inter-datacenter) connections or one site (e.g., headquarter) accessing to Internet. Considering typical scenarios, we canabstract network connections into general types. Throughthe appropriate abstraction, customers only need to choosethe appropriate connection type to conveniently request theirnetwork connections.

2. Flexible Bandwidth Configurations. For different customers,they need different bandwidth of network connectionsto satisfy practical communication requirements; while for onecustomer, its bandwidth requirement may frequently change.As a result, it is desirable to provide the ability to customizethe bandwidth.

3. Customized Network Policies. Currently, network policiesare generally provisioned via static configurations withlow flexibility. Thus, it is required to customize networkpolicies for more various demands of network connections.

With the above defined APIs, it is convenient to customize required WAN connections without performing complicated configurations.It is convenient of customers to use the APIs for WAN connections, but policy conflicts may occur when some policies process the same packets with conflicting actions.

Finally, to implement APIs, we design a system called Grace. This system achieves high efficiency in satisfying diverse requirements of network connections without policy conflicts, and centrally determines the bandwidth of each connection based on the network-wide topology. We find that Grace conveniently requests network connections via APIs and takes a few seconds to deploy them, dramatically reducing the time of network establishment compared to VPN.

II. CHALLENGES

To implement WAN as a service, a global control platform isneeded to dynamically orchestrate the network infrastructure,which is achieved by SDN. First, SDN takes a network-wideview to configure underlying network devices (e.g., switches).Second, centralized controlling creates opportunity to globallycontrol network policies requested by the customer. Third,SDN provides the ability to effectively schedule bandwidthresources in the network. Further, we summarize followingthree challenges to address.

Challenge 1: API Design. Establishing new connections requires the global view of network topology by manualdesign and careful configurations, which leads to inflexibilityand low efficiency.The APIs offer an opportunity to abstract connections into some unified types in a flexible way. Further,the interfaces cannot expose too much network informationsince it will put more pressure on network security. Thus,the challenge is to design appropriate APIs considering samecharacteristic of each connection.

Challenge 2: Conflict Detection. When a customer usesAPIs to request WAN connections, we should ensure policyconsistence when the same customer simultaneously requestsmultiple policies without being aware of possible conflicts. Ifa conflict happens, the network will behave abnormally.Thus, we need to centrally manage a large number of network policies to assure network correctness and stability. However,how to accurately check conflicts at runtime is a challenge.

Challenge 3: Bandwidth Allocation. The former represents that the bandwidth has to be guaranteed, while the latter allows customers to dynamically adjust bandwidthaccording to network condition. Thus, the challengeis to simultaneously consider the above features from multiplecustomers.Because of limited capacity, it is impractical to successfully allocate the bandwidth for network connections all the time.

III. GRACE DESIGN

To address above challenges, we design a system Grace to implement on-demandWAN connections.

3.1. System Design

Fig. 1illustrates the design of Grace system, which integrateswith three key solutions corresponding to three challenges.

Fig. 1. SDN based Grace architecture
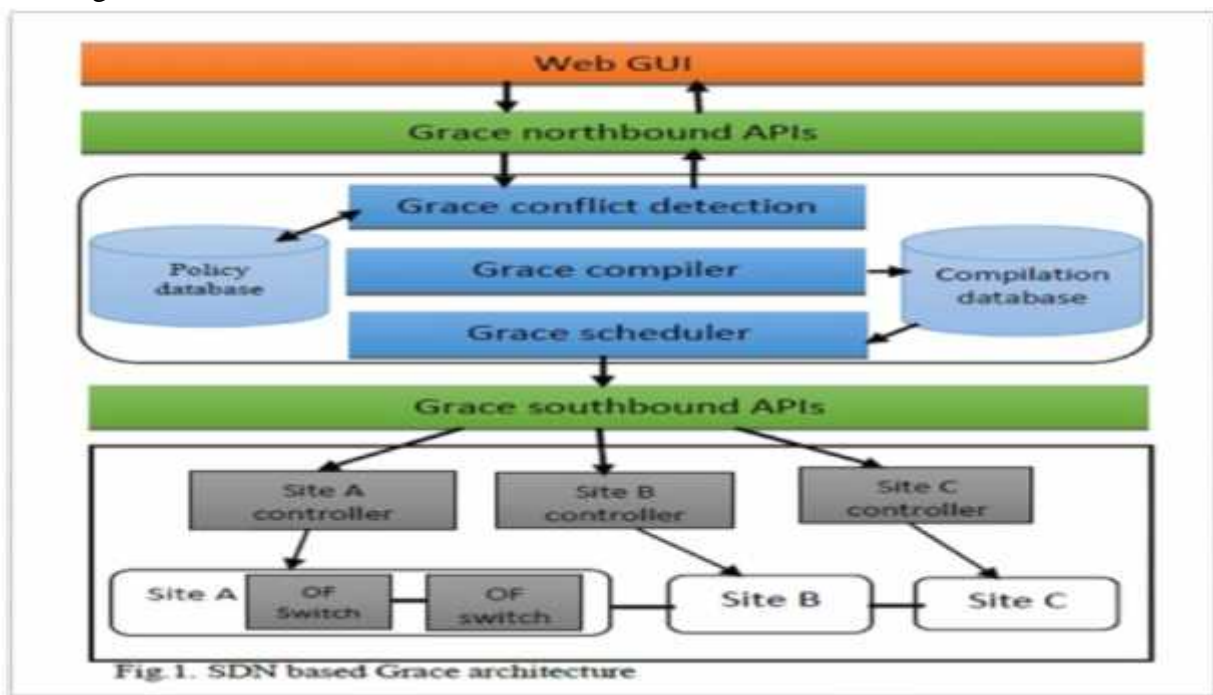
Northbound APIs allow customers to easily express requirednetwork connections with different types.

Conflict detection checks policies from the same customerby using the proposed policy conflict detection algorithm. If no conflict is detected, the system starts to compilerequested connections.

Compiler, as a critical component in Grace, is in chargeof mapping the classified connections into forwarding rulesconfigured by the network controller.Meanwhile, the compilerleverages the bandwidth allocation algorithm to allocate required bandwidth.

Scheduler is designed to manage the effective time ofconnections. Intuitively, on-demand network connections includereal-time deployment and further reservations. Thus,we need to address at the specified time when networkconnections are deployed. Thus, a component, named In thiscomponent, we introduce the timing triggering mechanism tokeep trace of start time and end time per connection. Whena new network connection is requested by the customer, thiscomponent would determine if the system needs to deploy itat once.

3.2. API design

Consider a typical scenario for WAN connections showingin Fig. 2. Company A establishes its private WAN, and itsheadquarter needs to communicate with its four branches,which is seen as enterprise Intranet. Meanwhile, every branchhas its own datacenter as private cloud that offers on-demandcomputing and storage resources, and public cloud providesscalable resources for company B. Thus, company A interconnectstheir datacenters, and public cloud connects with Internet. The headquarter has privilege to access all theseinterconnecting clouds. When a partner Company B cooperateswith company A, an end-to-end connection between headquarterand company B should be established. Consideringabove scenarios, we observe that network connections canbe classified into three typical types. These types are a)interconnecting with one or more endpoints; b) one endpointas the main traffic producer/consumer connecting with otherisolated endpoints that are as traffic consumers/producers; c)one endpoint accessing to Internet is viewed as a specialaccess point.
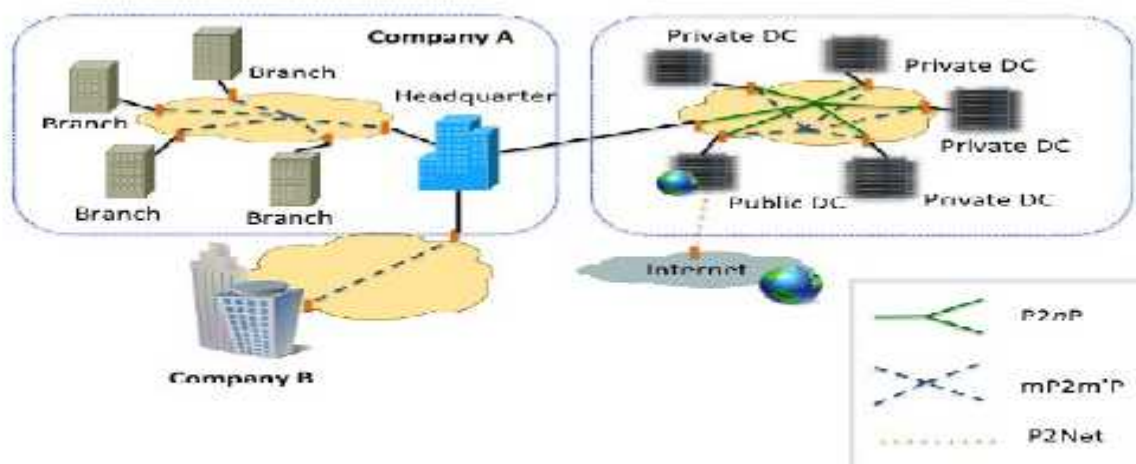

Fig. 2. The practical scenarios for the WAN.

For simplicity, we name these classifications as mP2m'P (m ≥ 1, m' ≥ 1), P2nP(n ≥ 2) and P2Net respectively, where m, m' and n present the number of endpoints. Specifically, when m=m'=1 in the mP2m'P, we call it the P2P. Notably, in the networkconnection, connected endpoints may share the same network policy.Thus, we abstract them as an endpoint group, and provide the group-based patterns to define network connections.

Based on above analysis, we design the open APIs for WAN as a service. The designed APIs follow the standardRest APIs [1], and are mainly based on the abstraction ofnetwork connections. These include:

✓ **Connection name**: the specified connection name.

✓ **Connection type**: a type field indicates the requiredconnection types containing mP2m'P, P2nP and P2Net.

✓ **Group list**: the list that contains one or more endpoint groups as connection anticipants. Each group has its location and role information (e.g., producer, consumer).

✓ **Connection effective time**: the start and end time of network connection.

✓ **Bandwidth/transmission size**: this is used for required bandwidth or transmission volume. Note that every time you are only allowed to define one of them.

✓ **Customized network policies**: this field enables customers to specify network policies for specific network functions.

✓

3.3. Grace Conflict Detection

The APIs offer the ability to customize WAN connections,and customers can request different network connectionswith specific policies. However, policies may be mutuallydependent, and two policies may exist irreconcilable conflicts.Therefore, it should be detected before the deployment.

The first type of conflicts is related to bandwidth.Suppose an enterprise's department wants to communicate with a serverin a datacenter with the specified bandwidth, while someemployees in this department need higher bandwidth for timely interaction with this server. If network operator requirestwo policies at the same time, the conflict would occur becauseof the different bandwidth requirements of the same end-to-endconnections. The second type is about conflicting networkactions. This conflict needs to be detectedimmediately. Further, APIs allow customers to define the startand end time as the effective time of a policy. The effective time is necessary condition of policy conflicts since in case ofconflicts their effective time must overlap. Based on above analysis, we propose a policy conflictdetection algorithm considering both resource reservation (correspondingto time overlapping) and safety guarantee (correspondingto conflicting types).

Fig. 3 shows overall process of the policy conflict detection. When a customer requests a policy, it is translated into the uniform format. Then the system identifies the type of this policy through a classifier. Consequently, the policy is assigned to the corresponding algorithm to check possible conflicts. To reduce the number of comparisons, we respectively create two databases for each type of policies, where policies with no conflicts are stored after previous detections. Finally, conflicting policies are gathered into the conflict set to notify customer by conflict notifier.

3.4. Bandwidth Allocation

Since bandwidth requirements of network connections continuouslychange, it is important to provide variable/ondemandbandwidth. Further, network connections have different sensitivities to latency. As shown in Fig. 2, companyA accessing the cloud requires bandwidth guarantee,which belongs to the low-latency connection; while the bulkdelivery usually takes place between connected datacenters,which requires transmission time and volume specificationswithout rigid bandwidth requirements. Thus, we divide networkconnections into two types. The first type is real-timeconnection with guaranteed bandwidth, while the other isnon real-time connection with specified volume and deadline.Especially, the characteristic of the second type creates theopportunity to dynamically adjust the bandwidth as long as the transmission completes before deadline. However, how to allocate bandwidth at each time for non real-time connections is a great challenge.

To distinguish the difference between two types of network connections, We introduce a pricing scheme, which offers the references to the system to decide which connections should make a prior to deploy in the network.

$$P_i^r = \alpha B_i^r T_i^r \qquad (1)$$

$$P_k^{nr} = \alpha \frac{G_k \times \log_2 G_k}{T_k^{nr}} \qquad (2)$$

We define P_i^r and P_k^{nr} respectively representing the price of real-time connection i and non real-time connection k. The parameter α in both equations represents the unit price of transmitting volume.

Allocation LP: The core of bandwidth allocation algorithmis to approximately maximize the revenue while preferringthe shorter paths as well as shorter time to complete nonreal-time data transmission. Algorithm 3 invokes the function*BandwidthAlloc* to compute available bandwidth of non realtimeconnections in each time interval, where *BandwidthAlloc*leverages the linear programming (LP). If there is no optimal solution for all the requested connectionswithin one interval, we iteratively choose the connectionset including both types with higher price by using bisectionmethod in the function *BisectionSearch*. Specifically, it firstsorts the price in descending order and then selects the firsthalf of set based on the descending order of price.

We introduce parameter$\lambda$to adjust the bandwidth allocation according to network congestion.The algorithm minimizes λ to obtain more bandwidthif there is sufficient bandwidth in the network.

IV. CONCLUSIONS

Cloud applications require the ability to customize WAN connections. Grace and its open APIs are designed to leverage the advantages of SDN to provide WAN as a service. First, we abstract network connections based on practical WAN scenarios for APIs, and thus customers are able to use them to easilyrequest on-demand WAN services.Second, to avoid policy conflicts, we propose a policy conflict detection algorithm considering the resource reservation and safety guarantee.Third, to address different requirements of latency-sensitive connections, we develop a LP-based bandwidth allocation algorithm by dynamic scheduling

of time and bandwidth. Meanwhile, we design a pricing scheme for various connection demands to maximize the SP revenue in the case that not all the connection requests can be fulfilled.

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Smart Health Care System Using Data Mining

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Abstract - Data mining is one of a new powerful technology which is of high used in moderncomputer world. It is a sub field of computer science that uses already existing data in different databases to transform it into new researches and results. In this data-rich world, people are running out of information. This can be a matter of risk for the person who needs immediate remedies regarding their poor health. To unfold this hurdle, the concept of data mining is the best suited. Here, the traditional approaches have been replaced by smart technologies. The main purpose of data mining application in healthcare system is to develop an automated tool for identifying and disseminating relevant healthcare information.In this system, we have presented a web based application for Predicting diseases based on user input symptoms. It predicts probable diseases by mining data sets and provides remedial solutions for Effective Diagnosis.
Keywords- SVM Algorithm , Data Mining , Web Application.

I. INTRODUCTION

Health is one of the most important assets of our life which directly reflects in any form of progress or development. In today's hustle and bustle of life, most of the people neglect this asset which may be due to lack of time and complexity in the vast data available over the Internet. Data mining has introduced various techniques which would overcome this problem and assist us to emphasize on both health and work simultaneously. In present era, Data Mining is becoming popular in healthcare field because there is a need of efficient analytical methodology for detecting unknown and valuable information in health data. In health industry, Data Mining provides several benefits such as detection of the fraud in health insurance, availability of medical solution to the patients at lower cost, detection of causes of diseases and identification of medical treatment methods.

It also helps the healthcare researchers for making efficient health care policies, constructing drug recommendation systems, developing health profiles of individuals etc. This data contains details regarding hospitals, patients, medical assert, cure cost etc. So, there is a must to create a commanding tool for scrutinizing and extracting significant information from this intricate data. The analysis of health data improves the healthcare by enhancing the concert of patient organization tasks. The results created by Data Mining technologies improve the progression of predicting the comparable patients and clustering them under a challenging group based on illness or fitness issues, so that healthcare involvement offers them effectual treatments.
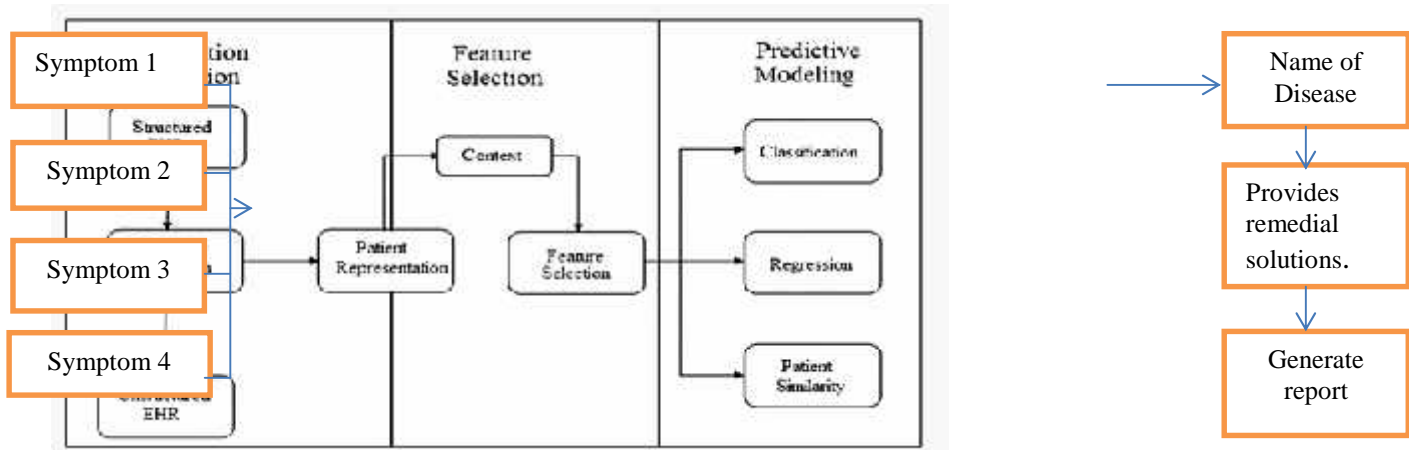
Fig:1 System Architecture

II. SUPPORTING VECTOR MACHINE ALGORITHM

Supporting Vector Machine algorithm is a classification algorithm based on Vector' theorems use in predictive modeling and this algorithm uses Vector techniques .This algorithm is less computationally intense then   other and therefore is useful for quickly generating mining models to discover relationships between input columns and predictable columns.
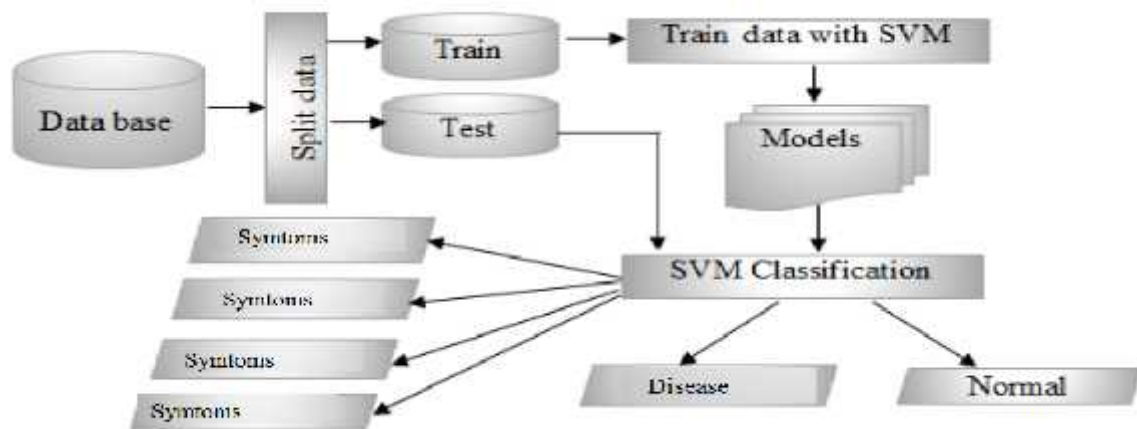
2.1 SVM Design

Fig:2 SVM Design

2.2 SVM Working

To evaluate the robustness of the SVM models, a 10-fold cross-validation was performed in the training data set.The training data set is first partitioned into 10 equal-sized subsets. Each subset was used as a test data set for a model trained on all cases and an equal number of non-cases randomly selected from the remaining nine datasets.This cross-validation process was repeated 10 times, and each subset serves once as the test data set.Test data sets assess the performance of the models.

III. MODULES DESCRIPTION

There are five modules using in this project,

User Interface Module

- Admin Login.
- Patient Login.

3.1 Admin Login: Admin can login to the system using his ID and Password.

1. Add Doctor: Admin can add new doctor details into the database.
2. Add Disease: Admin can add disease details along with symptoms and type.

3.1.1 Patient Login: Patient can Login to the system using his ID and Password.

1. Patient Registration: If Patient is a new user he will enter his personal details and he will have user Id and password through which he can login to the system.
2. Disease Prediction: - Patient will specify the symptoms caused due to his illness. System will ask certain question regarding his illness and predict the disease based on the symptoms and also suggest doctors based on the disease.
3. Search Doctor: Patient can search for doctor by specifying name or type.

3.2 Information extraction Module:

Extracting the information (disease) from the collection of dataset with the help of given input symptoms. This process is done one by one symptom given as an input. The structured dataset is derived from the unstructured data collection, the structured dataset frame by using feature extraction.

3.3 Feature selection Module:

In machine learning and statistical, feature selection is the process of selecting a subset of relevant features for use in model construction.

3.4 Predictive modeling Module:

Most often the event one wants to predict is in the future, predicting the disease which is corresponding to the given symptoms. This module is finally done the system process which means expected output will be consulted.

3.4.1. Classification: It is a data mining function that assigns items in a collection to target categories or disease. The goal of classification is to accurately predict the target disease for

3.4.2 Regression: It is a data mining technique used to predict a range of continuous values of disease. The process of training a regression model involves finding the parameter value of symptoms ,and it is used to minimize the measure of the accuracy of the disease and its symptoms.

IV. SCREENSHOT
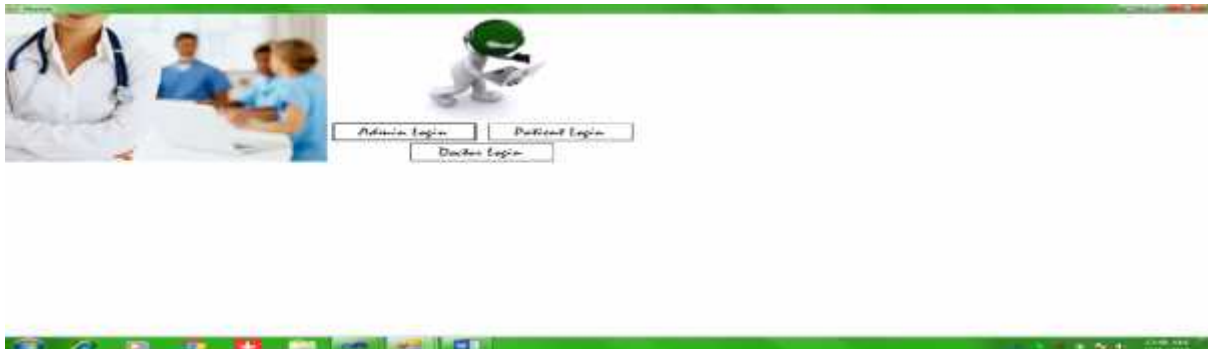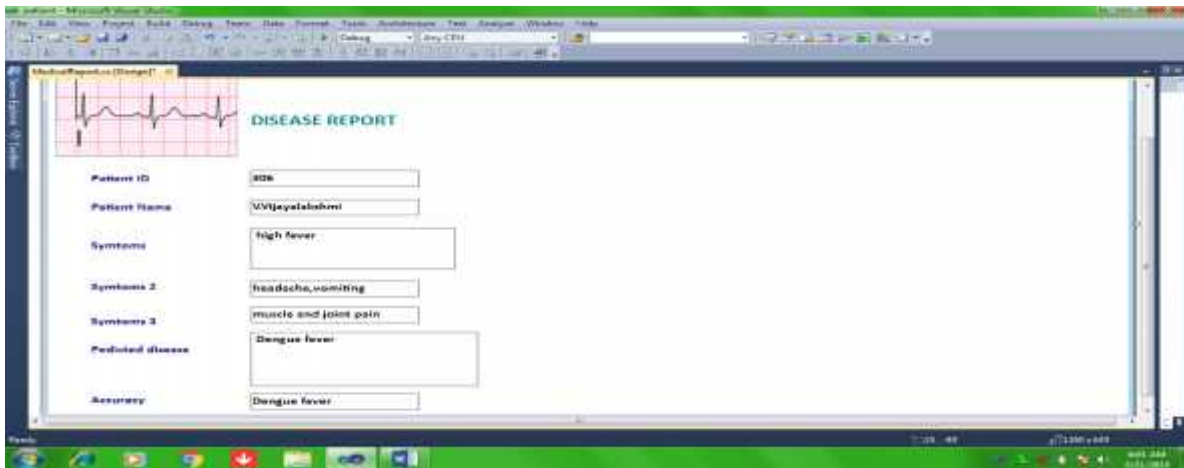
IV. CONCLUSION

The system is more convenient for immoveable patients and it will drastically reduce the human effort, reduce the cost and time constraint in terms of human resources and expertise, and increase the diagnostic accuracy. The prediction of diseases using Data Mining applications is a challenging and risky task as the data found are noisy, irrelevant and massive too. Knowledge obtained with the use of techniques of data mining can be used to make successful decisions that will improve efficiency of healthcare organization and health of patients. The results evaluated and finally our current system will accurately predict the result from the large amount of data.Through this SVM algorithm can be easily predicted and it is a time efficient process. The results evaluated and finally our current system will accurately predict the result from the large amount of data.

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Secure Password Storage and Authentication By Encrypted Negative Password

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Abstract- secure password storage is very much important thing for the systems which are based on password authentication. Because of the simplicity and efficiency it has been widely used. In ourframework, first, the received plain password from a client is hashed through a cryptographic hash function (e.g., SHA-256).Then, the hashed password is converted into a negative password.Finally, the negative password is encrypted into an encrypted negative Password (abbreviated as ENP) using a symmetric-key algorithm (e.g., AES), and multi iteration encryption could be employed to further improve security. The algorithm complexity analyses and comparisons show that the ENP could resist lookup table attack and provide stronger password protection under dictionary attack. It is worthmentioning that the ENP does not introduce extra elements (e.g., salt). Besides this, the ENP could still resist precomputation attacks. Most importantly, the ENP is the first password protection scheme that combines the cryptographic hash function, the negative password and the symmetric-key algorithm, without the need for additional information except the plain password.

I.INTRODUCTION

A password is a form of secret authentication data that isused to control access to a resource.The front line defense against intruders is the password system.The password is kept secret from those not allowed access,and those wishing to gain access a retested on whether or not they know the password and are granted or denied access accordingly. The use of passwords goes back to ancient times. Sentries guarding a location would challenge for a password. They would only allow a person in if they knew the password. In modern times, passwords are used to control access to protected computer operating systems, mobile phones, cableTV decoders, automated teller machines (ATMs),etc. A typical computer user may require passwords for many purposes: logging into computer accounts, retrieving e-mail from servers, accessing files, databases, networks, websites, and even reading the morning newspaper online. Despite the name, there is no need for passwords to be actual words; indeed passwords which are not actual words are harder to guess, but are generally harder for users to remember.

1.1. Typical Password Protection Schemes

1.1.1 Hashed Password: The simplest scheme to store passwords is to directly store plain passwords. However, this scheme presents a problem that once adversaries obtain the authentication data table, all passwords are immediately compromised. To safely store passwords, a common scheme is to hash passwords using a cryptographic hash function ,

because it is infeasible to directly recover plain passwords from hashed passwords. The cryptographic hash function quickly maps data of arbitrary size to a fixed-size sequence of bits. In the authentication system using the hashed password scheme, only hashed passwords are stored. However, hashed passwords cannot resist lookup table attack . Furthermore, rainbow table attack is more practical for its space-time tradeoff . Processor resources and storage resources are becoming richer, which makes the precomputed tables used in the above two attacks sufficiently large, so that adversaries could obtain a higher success rate of cracking hashed passwords.

1.1.2 Salted Password: To resist precomputation attacks, the most common scheme is salted password . In this scheme, the concatenation of a plain password and a random data (called salt) is hashed through a cryptographic hash function. The salt is usually generated at random, which ensures that the hash values of the same plain passwords are almost always different. The greater the size of the salt is, the higher the password security is. However, under dictionary attack, salted passwords are still weak. Note that compared with salted password, the ENP proposed in this paper guarantees the diversity of passwords without the need for extra elements (e.g., salt).

1.1.3 Key Stretching: To resist dictionary attack, key stretching , which converts weak passwords to enhanced passwords, was proposed. Key stretching could increase the time cost required to every password attempt, so that the power of defending against dictionary attack is increased. In the ENP proposed in this paper, like key stretching, multi-iteration encryption is used to further improve password security under dictionary attack, and compared with key stretching, the ENP does not introduce extra elements (e.g., salt).

II.NEGATIVE DATABASE

In the NDB, the compression of the complement of a positive database (denoted as DB) is stored. As described in, U = f0; 1gn denotes the universal set of n-bit sequences; x 2 U denotes an n-bit sequence; DB = fx1; x2; _ _ _; xmg denotes a positive database that contains m entries; then NDB stores the compression (implemented using the wildcard '*') of (U DB).

Some concepts of NDB are given below. Every entry in anndb contains three symbols: '0', '1', and '*'. The symbol '0' only match the bit 0, and the symbol '1' only match the bit 1; The symbol '*' can match either the bit 0 or 1. Every entry in an NDB consists of two kinds of positions: specified positions and unspecified positions. Positions where the symbols are '0' or '1' are called specified positions, while positions where the symbols are '*' are called unspecified positions. Accordingly, both '0' and '1' are specified symbols, and the '*' is the unspecified symbol. A sequence of bits is covered by one entry in an NDB; that is to say, the bits of the sequence are matched by the symbols of the entry at the specified positions. If a sequence of bits is covered by one entry in an NDB, we say that the sequence is covered by the NDB. If an NDB covers every entry in the (U-DB), we say that the NDB is complete; otherwise, it is incomplete. The NDB converted from a DB with only one entry is called the single NDB; otherwise, it is called the multiple NDB. There are two types of NDB generation algorithms, one for single ndbs and one for multiple ndbs. In the first type, clause distribution control algorithm , 1-hidden algorithm, 2-hidden algorithm , q-hidden algorithm , hybrid algorithm , p-hidden algorithm , and K-hidden algorithm were proposed successively. In the second type, the prefix algorithm , Randomize NDB (abbreviated as RNDB) , multiple-solution algorithm were proposed successively; certainly, these algorithms could also be used to Generate single ndbs.

III. THE PROPOSED FRAMEWORK

The proposed framework includes two phases: the registration phase and authentication phase. When adopting our framework to protect passwords in an authentication data table, the system designer must first select a cryptographic hash function

and a symmetric-key algorithm, where the condition that must be satisfied is that the size of the hash value of the selected cryptographic hash function is equal to the key size of the selected symmetric-key algorithm. For convenience, some matches of cryptographic hash functions and symmetric-key algorithms are given in Table.

Cryptographic Hash Functions	Symmetric-Key Algorithms	#Bits
MD5*	AES/IDEA/CAST-256/RC6	128
SHA-1*	CAST-256	160
SHA-224/SHA3-224	CAST-256	224
SHA-256/SHA3-256	AES/CAST-256/RC6	256
SHA-384/SHA3-384	RC5	384
SHA-512/SHA3-512	RC5	512

Table.1:cryptographic hash and symmetric key algorithms

3.1.Registration Phase

The registration phase is divided into six steps.

(1) On the client side, a user enters his/her username andpassword. Then, the username and plain password are transmitted to the server through a secure channel;

(2) If the received username exists in the authentication data table, "The username already exists!" is returned, which means that the server has rejected the registration

Request and the registration phase are terminated; otherwise, go to Step (3);

(3) The received password is hashed using the selected cryptographic hash function;

(4) The hashed password is converted into a negative password using an NDB generation algorithm (i.e., Algorithm A.1 or Algorithm A.2 in the Appendix);

(5) The negative password is encrypted to an ENP using the selected symmetric-key algorithm, where the key is the hash value of the plain password. Here, as an

Additional option, multi-iteration encryption could be used to further enhance passwords;
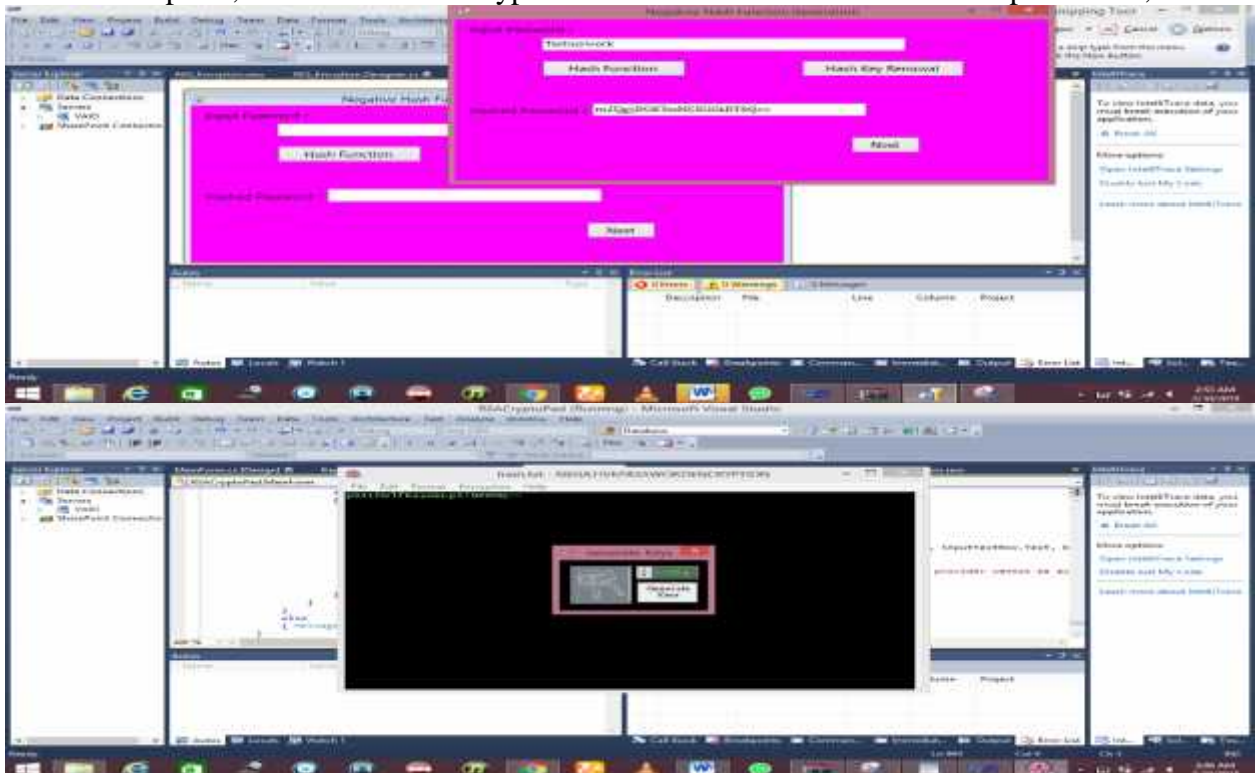

Figure.1:Key Selection Output

3.2. Authentication Phase

The authentication phase is divided into five steps.

(1) On the client side, a user enters his/her username and password. Then, the username and plain password are transmitted to the server through a secure channel.

(2) If the received username does not exist in the authentication data table, then "Incorrect username or password!" is returned, which means that the server has rejected the authentication request, and the authentication phase is terminated. otherwise, go to Step (3).

(3) Search the authentication data table for the ENP corresponding to the received username.

(4) The ENP is decrypted (one or more times according to the encryption setting in the registration phase) using the selected symmetric-key algorithm, where the key is the hash value of the plain password; thus, the negativePassword is obtained

(5) If the hash value of the received password is not the solution of the negative password (verified by Algorithm 1 or Algorithm 2), then "Incorrect username or password!" is returned, which means that the server has rejected the authentication request, and the authentication phase is terminated; otherwise, "Authentication success" is returned, which means that the server has accepted the authentication request.
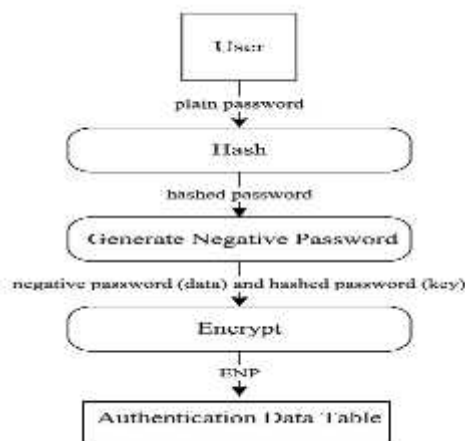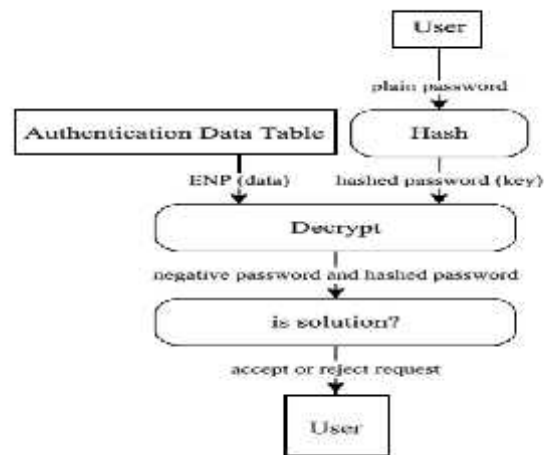

Figure.2:Authentication Phase   **Figure.3:Verification lgorithm**

IV. TWO IMPLEMENTATIONS OF ENCRYPTED NEGATIVE PASSWORD

In this section, we propose two implementations of the ENP, including their generation algorithms and verification algorithms. The first implementation is based on the prefix

Algorithm and we call it ENPI; the second one is based on a variant of the prefix algorithm , and we call it ENPII.

4.1. ENPI:

In ENPI, we employ the prefix algorithm with permutation (i.e., Algorithm A.1 in the Appendix) to generate negative passwords (i.e., NDBs). Negative passwords generated by the prefix algorithm are deterministic and complete . The conversation from a hashed password (i.e., a sequence of bits) to a negative password using the prefix algorithm is one-toone; therefore, the random permutation operation is employed to make the conversation from a hashed password to a negative password one-to-many by randomly reordering the bits of the sequence. The permutation is usually written as a tuple. For instance, "abc" is permuted to "cab" by the permutation (3, 1, 2), since 'c' in "cab" is the 3rd element in "abc", 'a' is the 1st element, and 'b' is the 2nd element. A negative password in ENPI contains exactly m entries, where m is the size of the hashed password; thus, the permutation is represented by a tuple

with m elements. An example is shown in Table III to illustrate the diversity of ENPI, where two examples (represented in hex form) of ENPI converted from the plain password "password" are listed.

4.1.1 Verification Algorithm:

After a user submits his/her username and plain password, the server first finds the corresponding ENP in the authentication data table according to the username. Next, the plain password is hashed and the ENP is decrypted. Then, the hashed password is verified to determine whether it is the solution of the negative password decrypted from the ENP. The responsibility of the ENP verification algorithm is to verify whether a hashed password is the solution of a negative password.
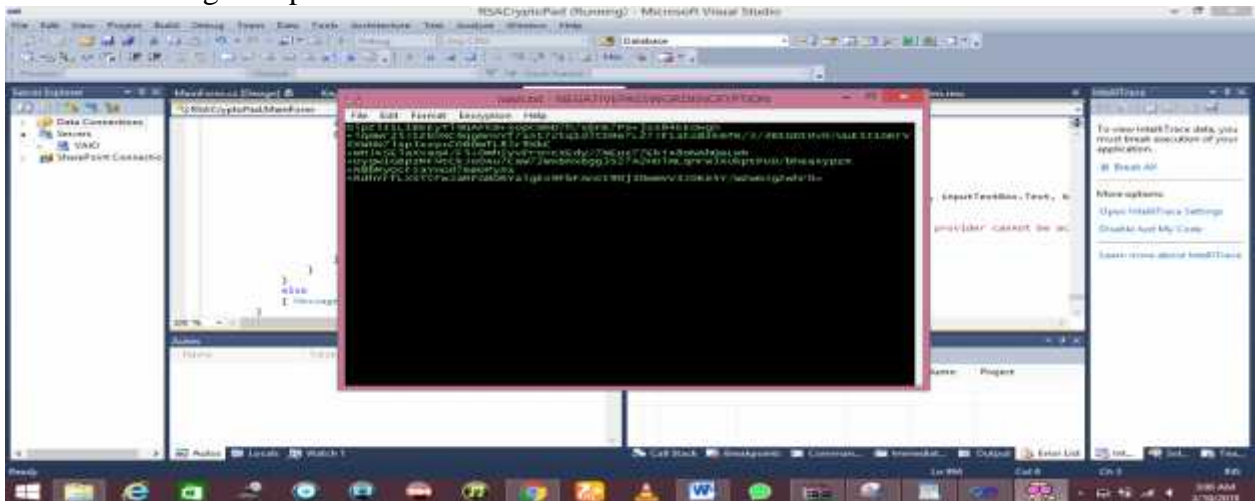

Fig.4:Negative Password Generation

4.2. ENPII

By comparison with ENPI, more randomization is introduced Into ENPII, which is based on a variant of the prefix algorithm (i.e., Algorithm A.2 in the Appendix), which has been proven to be complete and is easy to solve. A negative password in ENPII contains exactly m + 4 entries, where m is the size of the hashed password, and every entry has exactly three specified positions. Besides the permutation, more randomization is introduced during the conversion from an entry to an entry that only contains three specified positions.

4.2.1 Generation Algorithm:

In ENPII, Algorithm A.2 is employed to convert a hashed password to a negative password, where the input s is the hash value of the received plain password, and the output NDB is the resulting negative password.

4.4.2 Verification Algorithm:

In this subsection, we propose a method for verifying whether a hashed password is the solution of a negative password in ENPII. Firstly, the ENPII verification algorithm verifies whether the inputted negative password is legal. From Algorithm A.2,it can be inferred that a legal negative password in ENPII satisfies four conditions: (1) every entry has three specified positions, (2) the last six entries can be merged into two entries, (3) after merging, the last entry has one specified position; the penultimate entry has two specified positions; for each entry, there is only one specified symbol that does not match the corresponding bit of the original hashed password, and these specified symbols are at different positions, and (4) after merging, any specified position (except the one where the symbol does not match the corresponding bit of the original hashed password) of any entry (except the last one) must also be a specified position of its latter any entry.

Algorithm 1 ENPI Verification Algorithm

Input: a hashed password hashP;
A negative password np
Output: true or false
1: m   LENGTH (hashP)
2: for i   1 to m with stepsize of 1 do
3: if NUMBEROFSP (npi) 6= i then
4: return false
5: end if
6: end for
7: for i   1 to m with stepsize of 1 do
8: if NUMBEROFSP (npi) 6= 1 then
9: return false
10: end if
11: k   INDEXOFSP (npi)
12: x[k]   : TOBIT (npi[k])
13: for j   i + 1 to m with stepsize of 1 do
14: if npj [k] 6= TOSYMBOL(x[k]) then
15: return false
16: end if
17: npj [k] '*'
18: end for
19: end for
20: if x = hashP then
21: return true
22: else
23: return false
24: end if

Negative password is legal. From Algorithm A.1, it can be inferred that a legal negative password in ENPI satisfies three conditions: (1) the ith entry has i specified positions, (2) for each entry, there is only one specified symbol that does not match the corresponding bit of the original hashed password, and these specified symbols are at different positions, and (3) the specified positions of any entry (except the first entry) cover that of its preceding one. The pseudo-code of the ENPII verification algorithm is shown in Algorithm 2, where NUMBEROFDS(x; y) at Lines 7 and 14 counts the number of different symbols between x and y (Note that '*' and '0' or '1' are different); MERGE(x; y) at Lines 10, 11, 12, and 17 constructs one entry that has the symbol '*' at the position where x (or y) has the symbol '0', and y (or x) has the symbol '1', and the same symbols

At other positions with x and y (Before merging, we have ensured that x and y have different specified symbols at only one specified position and the same symbols at the other positions). Satisfying the conditions at Lines 3, 7, 14, 20, and

26 illustrates that np is not an output of Algorithm A.2, i.e., the np is a illegal negative password in ENPII, and the algorithm is terminated in advance. If the negative password is legal, when

Judging the legitimacy, the negative password is solved, and then the solution and hashed password are tested for equality.

Algorithm 2 ENPII Verification Algorithm

Input: a hashed password hashP;
A negative password np
Output: true or false
1: m   LENGTH (hashP)
2: for i   1 to m + 4 with stepsize of 1 do
3: if NUMBEROFSP (npi) 6= 3 then
4: return false
5: end if
6: end for
7: if NUMBEROFDS (npm   1; npm) 6= 1 or
NUMBEROFDS (npm+1; npm+2) 6= 1 or
NUMBEROFDS (npm+3; npm+4) 6= 1
Then
8: return false
9: else
10: npm   1   MERGE (npm   1; npm)
11: npm+1   MERGE (npm+1; npm+2)
12: npm+3   MERGE (npm+3; npm+4)
13: end if
14: if NUMBEROFDS (npm+1; npm+3) 6= 1 then
15: return false
16: else
17: npm   MERGE (npm+1; npm+3)
18: end if
19: for i   m to 1 with stepsize of   1 do
20: if NUMBEROFSP (npi) 6= 1 then
21: return false
22: end if
23: k   INDEXOFSP (npi)
24: x[k]   : TOBIT (npi[k])
25: for j   i   1 to 1 with stepsize of   1 do
26: if npj [k] 6= TOSYMBOL(x[k]) or '*' then
27: return false
28: end if
29: npj [k]   '*'
30: end for
31: end for
32: if x = hashP then
33: return true
34: else
35: return false
36: end if

4.3. ADVANTAGES
4.3.1 No Dependence on Salt:
With a key stretching algorithm. Adding salts is a widely used method to resist precomputation attacks, however, it tends to be implemented by mistake (such as salt reuse

and short salt), which poses a potential security exposure and puts higher requirement on programmers. In addition, programmers need to pay attention to the storage and usage of salts. Conversely, the ENP only needs to select a pair of cryptographic hash function and symmetric-key algorithm without the need for extra elements (such as salt), which indicates that our scheme is programmer-friendly.

4.3.2 Resistance to Lookup Table Attack:

Given a plain password, there are lots of corresponding ENPs, i.e., the ENPs converted from the same password are almost always different, which makes it effectively resist lookup table attack. Furthermore, for the same passwords of a user in different systems, because the corresponding ENPs are almost always different, even if an adversary obtains two ENPs in different authentication data tables from different systems, the adversary cannot determine whether the original plain passwords corresponding to the two ENPs are the same.

4.3.3 Resistance to Dictionary Attack:

In the ENP, multiiteration encryption is used to defend against dictionary attack By making every password attempt consume more time. Even though hardware approaches are used, the passwords generated by our scheme are still strong, since our scheme could not Only increase the number of encryptions, but also replace the cryptographic hash function.

V. Conclusions And Future work

In this paper, we proposed a password protection scheme called ENP, and presented a password authentication framework based on the ENP. In our framework, the entries in the authentication data table are ENPs. In the end, we analyzed and compared the attack complexity of hashed password, salted password, key stretching and the ENP. The results show that the ENP could resist lookup table attack and provide stronger password protection under dictionary attack. It is worth mentioning that the ENP does not need extra elements (e.g., salt) while resisting lookup table attack .multi iteration can be done for increasing the security. Here two keys such as public key and private key has been generated. So the user can also have the control in one end. In the future, other NDB generation algorithms will be studied and introduced to the ENP to further improve password security. Furthermore, other techniques, such as multi–factor authentication and challenge–response authentication, will be introduced into our password authentication framework.

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Reliable and Energy-efficient Hybrid Screen Mirroring Multicast System

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Abstract-Data sharing in networks are now days a challenging one where the source is sending a video file to destination, major problem is interference. Once the router is set to search for a path takes too time for identifying a better path to transmit data. The performance is affected due to the time delay of searching path and the interference cause data loss or interruption of transmission. To solve this problem and provide multicast video streaming over Wi-Fi network, some research efforts have been devoted to overhearing and forward error correction (FEC)-based multicast transmission. In this method, the sender delivers the data to the target receiver using uncast transmission while the non-target receivers overhear the uncast transmission. Because the rate adaptation and MAC-layer retransmission are operated by the uncast transmission between the sender and the target receiver, high transmission rate can be achieved. Moreover, FEC schemes are employed to provide reliable data delivery to the non-target receivers who cannot utilize the MAC-layer retransmission. The proposed system not only shapes the screen mirroring traffic, but also determines the target sink device and Raptor encoding parameters such as the number of source symbols, symbol size, and code rate while considering the energy consumption and processing delay of the Raptor encoding and decoding processes.

Index Terms— Screen content, Screen mirroring, WiFi, Multicast, Systematic Raptor codes, Overhearing

I.INTRODUCTION

SCREEN mirroring technology enables a mobile device to duplicate its screen content in real-time onto a large display device, such as monitor, TV, and projector. This technology allows the mobile user to overcome the constraints of the small display unit in a mobile device. Furthermore, screen mirroring can be applicable to various applications, such as gallery sharing, presentations, mobile streaming, and mobile gaming . Because of its wide range of applications, state-of-the-art mobile devices typically offer screen mirroring functionality, and some commercial products are already available, e.g., AirPlay, Chromecast , MirrorOp , Splashtop, and Miracast .

In particular, Miracast, which is developed by the WiFi Alliance, aims to act like a wireless High Definition Multimedia Interface (HDMI) cable. In Miracast, the source device (i.e., the mobile device) encodes the screen content with H.264/AVC and transmits the compressed video data to the sink device (i.e., typically WiFi enabled

receiver connected to a TV or display device) using Real-Time Streaming Protocol (RTSP) and WiFi Direct. Recently, the demand for screen content sharing among adjacent mobile devices has been increasing for conferences, lectures, etc. However, it is still challenging to provide screen mirroring for multiple adjacent devices because existing screen mirroring technologies support only one-to-one connection. To handle this problem, it is necessary to enable WiFi multicast for screen mirroring.

Unfortunately, there are several well-known problems in the WiFi multicast. One of the most serious problems is unreliable packet delivery caused by the absence of acknowledgment and packet A reliable and energy efficient hybrid screen mirroring multicast system for sharing high-quality screen content among adjacent mobile devices. In the proposed system, the overhearing based multicast scheme is employed to overcome well known problems of the WiFi multicast. To mitigate the video quality degradation caused by packet loss, the proposed system utilizes systematic Raptor codes as an FEC scheme and NACK-based retransmission scheme as an ARQ scheme for error correction. Raptor codes are a class of fountain codes and a block-based FEC scheme that provide systematic coding, flexibility, coding efficiency, and rate less codes. These characteristics are very useful for transmitting delay-sensitive data over error-prone wireless networks. The proposed system is designed to minimize energy consumption at the source device and sink devices while still providing a high quality screen mirroring service.

To achieve this goal, an energy consumption model of a WiFi network interface is derived, and then simple but effective energy consumption and delay models for Raptor encoding and decoding processes are obtained. Based on the derived models, the proposed system is designed to shape the screen mirroring traffic based on the buffer occupancy of the sink device and determine the target sink device and Raptor encoding parameters to minimize the overall energy consumption.

Our main contributions are summarized below;

• Introduction of an energy consumption model of a WiFi network interface for the overhearing-based multicast scheme.

• Introduction of energy consumption and delay models for the SIMD-based Raptor encoding and decoding process.

• Design of a target sink device and code rate determining algorithm for the overhearing-based multicast environment by taking into account the wireless network conditions and the energy consumption of WiFi network interfaces.

• Adjustment of Raptor encoding parameters such as code rate, symbol size, number of source symbols, and number of Raptor encoding blocks on the fly by considering time-varying wireless networks and energy consumption of Raptor encoding and decoding processes.

• Implementation of the entire proposed system on Linux-based single board computers and examination of the proposed system in real wireless network environments

II.RELATED WORK

` So far, many research efforts have been devoted to screen mirroring compared the performance of state-of-the-art screen mirroring technologies. According to their measurements, there is no single winning screen mirroring technology, and there is some room for improvement through design considerations, such as rate adaptation mechanisms and error resilience tools. Furthermore, they implemented a rate adaptation mechanism for a screen mirroring platform presented practical screen sharing system in resource constrained environment. They developed a simple mechanism to transform inter-update temporal

redundancy into intra-update spatial redundancy, and achieved good compression rates and high screen capture rates conducted a measurement study on the power consumption of Miracast. Using insights from the measurement, they proposed some energy efficient mechanisms such as adaptive video tail cutting, redundant codec operation bypass, and least congested channel selection. Ha et al. presented a frame filtering method that reduces the Miracast traffic load by analyzing the dynamism of screen content. Similarly, proposed an adaptive frame skipping method that analyzes the motion dynamics of screen content. However, it is still challenging to provide screen mirroring multicast because existing screen mirroring systems are limited to unicast transmission. To solve this problem, it is necessary to enable WiFi multicast for screen mirroring. To date, many research efforts have focused on providing multicast media delivery system over WiFi network proposed a leader-based multicast service (LBMS) to improve the reliability and efficiency of WiFi multicast.

Although the leader client of a multicast group can send feedback frames for retransmission request and rate adaptation, LBMS still cannot provide sufficient goodput for high-quality video multicast. To improve the goodput of a WiFi multicast, used the unicast transmission to deliver the IPTV stream to a target receiver, while non-target receivers overhear the unicast transmission. This WiFi multicast transmission method is called pseudo-broadcast.

Their analysis show that the pseudo-broadcast achieves high transmission rate with retransmission and rate adaptation for only one target receiver, and it cannot provide reliable packet delivery for non-target receivers.

One of the major concerns of screen mirroring multicast technology is the amount of energy needed by the mobile device to conduct multicast transmission over the wireless network. To date, many energy-efficient wireless networking technologies have been proposed to improve the energy efficiency of the network interface on a mobile device with limited battery capacity.

III.EXISTING SYSTEM

One of the major concerns of screen mirroring multicast technology is the amount of energy needed by the mobile device to conduct multicast transmission over the wireless network. To date, many energy-efficient wireless networking technologies have been pro-posed to improve the energy efficiency of the network interface on the device with limited battery capacity. It was shown that traffic shaping using a proxy server can save more energy than adjusting the mobile device sleep time. Presented an ES-treamer to provide energy-efficient multimedia streaming service. E-Streamer determines an optimal burst size and idle period length for a streaming client to allow the mo-bile device to reduce their energy consumption with seamless multimedia streaming. The existing routers takes too much of time to search a path for data transmission between source and destination. Performance is slow as well as interference occurred during each transmission.

IV.PROPOSED SCREEN MIRRORING MULTICAST SYSTEM

The proposed system aims to provide a high-quality and energy-efficient screen mirroring multicast service among adjacent mobile devices over WiFi network. As mentioned earlier, systematic Raptor code and NACKbased retransmission scheme are adopted in the proposed system to recover lost packets over the error prone WiFi network. For energy saving at mobile devices, the proposed system shapes the screen mirroring traffic, and determines the target sink device and the Raptor encoding parameters based on the estimated energy consumption models of the WiFi network interface and Raptor encoding and decoding processes.

The proposed system is de-signed to minimize energy consumption at the source device and sink devices while still providing a high-quality screen mirroring service. To achieve this goal, an energy consumption model of a Wi-Fi network interface is derived, and then simple but effective energy consumption and delay models for Raptor encoding and decoding processes are obtained.

Introduction of an energy consumption model of a Wi-Fi network interface for the overhearing-based multicast scheme. Energy consumption and delays for encoding and decoding process.

Design of a target sink device and code rate determining algorithm for the overhearing-based multicast environment by taking into account the wireless network conditions and the energy consumption of Wi-Fi net-work interfaces. Implementation of the entire proposed system on Linux-based single board computers and examination of the proposed system in real wireless network environments. The system concentrates on this point and study the minimum number of infrastructure nodes that need to be added in order to maintain a specific property in the overlay routing. We develop a nontrivial approximation algorithm and prove its properties. We demonstrate the actual benefit one can gain from using our scheme in three practical scenarios, namely BGP routing, TCP improvement, and VoIP applications.
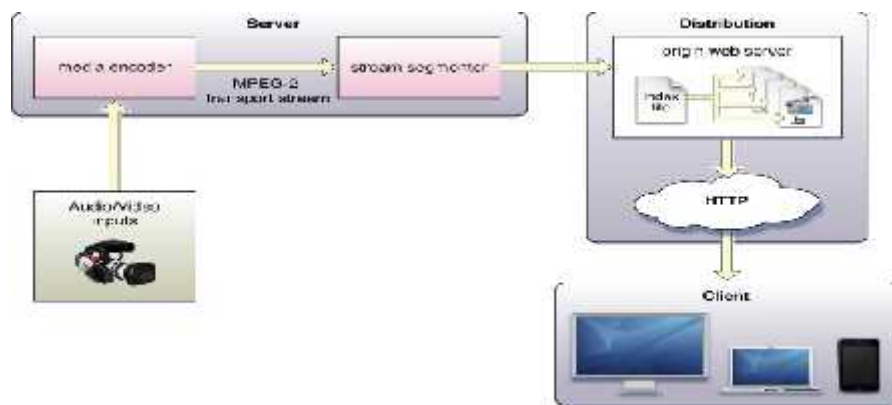

Fig. 1. Overall architecture of the proposed system.

In the sender side machine, initially user wants the ip address and port number of the target machine that is receiver side machine. Then in the sender side machine we are using two protocols, they are Video For Window (VFW) and Heuristic Distributed Protocol (HDP). In the receiver side machine also, initially the user wants the ip address and port number of the sender side machine. We use two rounds to find two paths together with spectrum allocation. In each round, the receiver broadcasts the path discovery message to its neighbors. Each intermediate node updates its currently best path and spectrum allocation to the receiver, and further broadcasts the update information. Once the sender has received the update messages, it selects a best path and spectrum allocation and replies to the receiver. HDP scans the data transferred from port. Whenever any media streams have been transferred across the receiver application and sender application. HDP is adapted in both sender side as well as the receiver side. In both side it will report the information passed across the channel.

4.1 Energy Consumption Model and Delay Model

In this section, we propose an energy consumption model of the WiFi network interface and energy consumption models and delay models for Raptor encoding and decoding processes.

4.1.1 Energy Consumption Model for WiFi Network Interface

The general energy consumption patterns of the WiFi network interfaces at the source device and sink devices are presented in Fig. 3. Because the source device behaves like an AP, it periodically broadcasts beacon messages to the sink devices during the inactive state. The sink deviceses constantly listen to the wireless channel to overhear unicast transmission. When there is data to be received from the source device, the target sink device requests the data from the source device. Now, the source device transmits data using unicast transmission to the target device, and the non-target devices immediately overhear these

data. After completing the data transmission, the source device and target sink device enter into the inactive state if there is no additional data for tail time.

4.1.2 Energy Consumption and Delay Model for Raptor Encoding/Decoding

Processes For Raptor encoding and decoding processes, the XOR operation is the most dominant process . Thus, the energy consumption for Raptor encoding and decoding processes can be predicted based on the amount of XORed bytes, which is calculated by multiplying the symbol size by the number of symbol-level XOR operations. In the proposed system, we implemented Raptor codes using a single instruction multiple data (SIMD) technology to improve the performance of the Raptor encoding and decoding processes. The SIMD is a wellknown parallel processing technology that enables the parallel processing of multiple data with a single instruction, e.g., matrix summation and multiplication. Since the performance of the Raptor codes in the proposed system is affected by the SIMD-based implementation, we derive the SIMD-based energy consumption and delay models. Hence, it is very difficult to find the typical coefficients of the energy models. But several device manufacturers provide the power profile to estimate the device energy consumption . If the power profile is offered by device manufacturer, then we can approximately calculate the coefficients of the energy models.

4.2 Parameter Determining Algorithm

In this section, we present the parameter determining algorithm to obtain a feasible solution. First, the target sink device and code rate determining algorithm is studied.
Then, the Raptor encoding parameter selection algorithm is described in detail. Target Sink Device and Code Rate Determining Algorithm We provide the determining algorithm for v and c. In the target sink device and code rate determining problem, when the target sink device is fixed, the solution candidates of c can be obtained by calculating the code rates which can achieve a successful Raptor decoding at a certain sink device. Thus, the optimal solution of v and c that minimizes the given cost function ( ) ,cor pktn vc can be easily obtained by conducting a full search among all possible candidates of c for all sink devices.
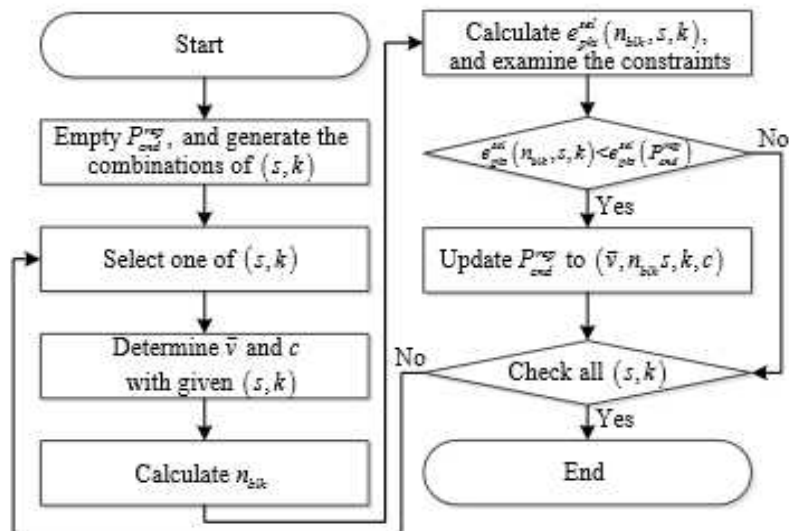

Fig. 2. Overall procedure of the parameter determining algorithm.

Fig. 3. Proposed system implemented on ODROID.

V.MODULES

Modules are units of code written in access basic language. We can write and use module to automate and customize the database in very sophisticated ways.

Thus they have four types,

- Sender
- Receiver
- Distributed Routing and Channel Allocation
- Heuristic Distributed Protocol

5.1 Sender

In the sender side machine, initially user wants the ip address and port number of the target machine that is receiver side machine. The sender can capable of storing the file in the local machine. Then in the sender side machine we are using two protocols, they are Video For Window (VFW) and Heuristic Distributed Protocol (HDP).

5.2Receiver

In the receiver side machine also, initially the user wants the ip address   and port number of the sender side machine. So now the communication is established between the sender side machine and receiver side machine.

5.3Distributed Routing and Channel Allocation

We use two rounds to find two paths together with spectrum allocation. In each round, the receiver broadcasts the path discovery message to its neighbors. Each intermediate node updates its currently best path and spectrum allocation to the receiver, and further broadcasts the update information. Once the sender has received the update messages, it selects a best path and spectrum allocation and replies to the receiver.

5.4 Heuristic Distributed Protocol:

HDP scans the data transferred from port. Whenever any media streams have been transferred across the receiver application and sender application. It just track the data transferred from the sender application. HDP is adapted in both sender side as well as the receiver side. In both side it will report the information passed across the channel.

VI.CONCLUSION

In this paper, we have proposed a reliable and energyefficient hybrid screen mirroring multicast system for sharing high-quality screen mirroring service among adjacent sink devices. In the proposed system, systematic Raptor codes and NACK-based retransmission are employed to reduce the video quality degradation over an error-prone WiFi network. The proposed system not only shapes the screen mirroring traffic, but also determines the target sink device and Raptor encoding parameters while considering the energy consumption of the source device and sink devices. The proposed system has been fully implemented in Linux-based single board computers, and tested over a real WiFi network. Experimental results show that the proposed system can provide energy savings of 39.05% compared to

ACK-based multicast systems while providing the same level of video quality. Furthermore, the proposed system can provide high quality screen mirroring without noticeable video quality degradation compared to existing systems.

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13. Reliable Video Multicast over Wi-Fi Networks with Coordinated Multiple APsMunhwan Choi Samsung Electronics Co., Ltd. Suwon, 443-803, Korea mhchoi@mwnl.snu.ac.kr

Gene Based Disease Prediction Using Pattern Similarity Based Classification

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Abstract— The DNA microarray technology has modernized the approach of biology research in such a way that scientists can now measure the expression levels of thousands of genes simultaneously in a single experiment. Gene expression profiles, which represent the state of a cell at a molecular level, have great potential as a medical diagnosis tool. Diseases classification with gene expression data is known to include the keys for addressing the fundamental harms relating to diagnosis and discovery. The recent introduction of DNA microarray technique has complete simultaneous monitoring large number of gene expressions possible. With this large quantity of gene expression data, experts have started to discover the possibilities of disease classification using gene expression data. Quite a large number of methods have been planned in recent years with hopeful results. But there are still a set of issues which need to be address and understood. In order to gain insight into the disease classification difficulty, it is necessary to get a closer look at the problem, the proposed solutions and the associated issues all together. In this project, we present a comprehensive clustering method and classification method such as Particle Swarm Optimization (PSO), K-NN classification algorithm and estimate them based on their evaluation time, classification accuracy and ability to reveal biologically meaningful gene information. Based on our multiclass classification method to diagnosis the diseases and also find severity levels of diseases. Our experimental results show that classifier performance through graphs with improved accuracy.
Index Terms—Bio-medical research, DNA microarray, Gene sequence, Clustering, Classification

I.INTRODUCTION

Microarray technology has become one of the indispensable tools that many biologists use to monitor genome wide expression levels of genes in a given organism. A microarray is typically a glass slide on to which DNA molecules are fixed in an orderly manner at specific locations called spots (or features). A microarray may contain thousands of spots and each spot may contain a few million copies of identical DNA molecules that uniquely correspond to a gene. The DNA in a spot may either be genomic DNA or short stretch of oligo-nucleotide strands that correspond to a gene. The spots are printed on to the glass slide by a robot or are synthesized by the process of photolithography. Microarrays may be used to measure gene expression in many ways, but one of the most popular applications is to compare expression of a set of genes from a cell maintained in a particular condition (condition A) to the same set of genes from a reference cell maintained under normal conditions (condition B). Clustering techniques have proven to be helpful to understand gene

function, gene regulation, cellular processes, and subtypes of cells. Genes with similar expression patterns (co-expressed genes) can be clustered together with similar cellular functions. This approach may further understanding of the functions of many genes for which information has not been previously available. Furthermore, co-expressed genes in the same cluster are likely to be involved in the same cellular processes, and a strong correlation of expression patterns between those genes indicates co-regulation. Searching for common DNA sequences at the promoter regions of genes within the same cluster allows regulatory motifs specific to each gene cluster to be identified and cis-regulatory elements to be proposed. The inference of regulation through the clustering of gene expression data also gives rise to hypotheses regarding the mechanism of the transcriptional regulatory network. Finally, clustering different samples on the basis of corresponding expression profiles may reveal sub-cell types which are hard to identify by traditional morphology-based approaches.

1.1 Challenges in gene clustering:

Due to the special characteristics of gene expression data, and the particular requirements from the biological domain, gene-based clustering presents several new challenges and is still an open problem. First, cluster analysis is typically the first step in data mining and knowledge discovery. The purpose of clustering gene expression data is to reveal the natural data structures and gain some initial insights regarding data distribution. Therefore, a good clustering algorithm should depend as little as possible on prior knowledge, which is usually not available before cluster analysis. For example, a clustering algorithm which can accurately estimate the "true" number of clusters in the data set would be more favored than one requiring the pre-determined number of clusters. Second, due to the complex procedures of microarray experiments, gene expression data often contain a huge amount of noise. Therefore, clustering algorithms for gene expression data should be capable of extracting useful information from a high level of background noise. Third, our empirical study has demonstrated that gene expression data are often "highly connected", and clusters may be highly intersected with each other or even embedded one in another. Therefore, algorithms for gene-based clustering should be able to effectively handle this situation. Finally, users of microarray data may not only be interested in the clusters of genes, but also be interested in the relationship between the clusters (e.g., which clusters are more close to each other, and which clusters are remote from each other), and the relationship between the genes within the same cluster (e.g., which gene can be considered as the representative of the cluster and which genes are at the boundary area of the cluster). A clustering algorithm, which can not only partition the data set but also provide some graphical representation of the cluster structure, would be more favored by the biologists. Fig 1 shows basic gene symbols structure as
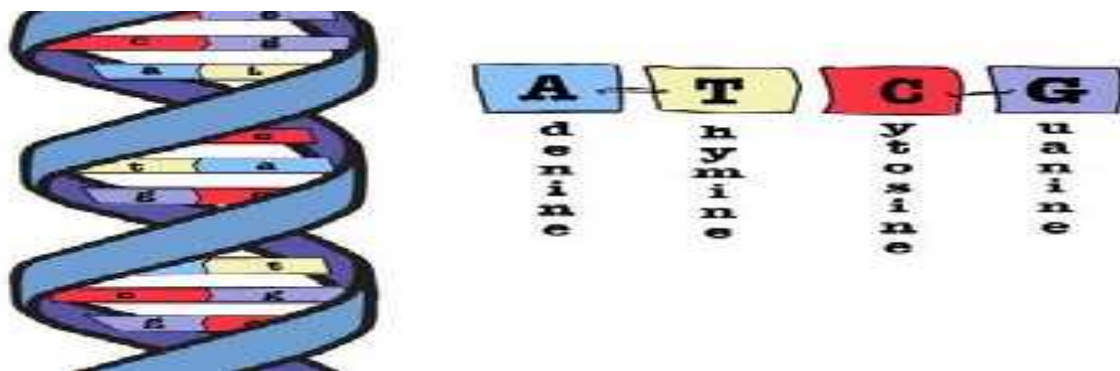

Fig 1: Gene symbols

II.RELATED WORK

Booma,et.al,…[1] identifyed normal or abnormal genes is important for clinical analysis and diagnosis. In this work, a novel framework for analyzing gene data was designed and developed. For this, initially, Bio-information from gene expression data was evaluated with the establishment of analyzing biological process using heuristic search [BPPD]. BPPD method identified the biological process on physiological data using heuristic search algorithm in rough set theory for gene-expression data analysis. This method extracted the biological process on gene expression data. The proposed method used heuristic search algorithm for identifying the biological process and processed based on two phases. The first phase was initialization phase and another was iterative adjustment phase. With respect to these two phases, the biological process of each gene and gene selection for a dataset is identified in terms of physiological data on gene expression datasets. Experimental evaluations are conducted for heuristic search based analysis of biological process on physiological data with standard benchmark gene expression data sets from research repositories such as broad institute in terms of size of gene expression datasets. Finally, issues in presence of extract the bi-cluster based gene expression information was addressed with proposed Bi-clustered Ant Optimized Feature Relational Sequencing (BAOFRS) method. The features used to identify the relational sequences also computed the similarity value between the sequences BAOFRS method used the K-mers relational knowledge sequence to identify the relational features. Jaccard similarity coefficient was applied to identify the similarity value on relational features.

Balasubramanian,et.al,…[2] proposed fuzzy logic based preprocessing technique to reduce the redundant information and grouping the similar genes from large amount of microarray data. The propose Parallel Island Model GA is implemented for gene feature selection process. Our propose feature selection algorithm is implemented based on multi objective genetic algorithm. This uses a different operator called multi objective operator. Multi objective aspect is defined to find the pareto optimal solutions for ranking. Since the search space is large and requires a good diversity, island model has been proposed. Finally the Fuzzy Based Parallel Island Model GA has been implemented by using parallelization tool Open MP.This FPIMMOGA is used to progress the gene subsets and whose fitness is calculated by parallel version of SVM classifier. We have done Fuzzy preprocessing technique for reducing the input data and implemented our FPIMMOGA using parallel programming (Open MP) .The best features are selected in short time. The best identified gene subsets are evaluated by parallel version of SVM Classifier. The method has given good classification accuracy than other methods. This method uses the island model for generating the best population. The multiple islands are implemented in parallel, which has significantly reduced the execution time in the process of best feature selection. In this work standard microarray breast cancer data sets are taken from Kent Ridge Biomedical Data Set Repository

Thangaraju,et.al,… [5] provided a study of various technical and review papers on lung, liver and Breast cancer data sets and explores that data mining techniques offer great promise to uncover patterns hidden in the data that can help the clinicians in decision making. From the above study it is observed that the accuracy for the diagnosis analysis of various applied Data mining Classification techniques, Implementation of the techniques are highly acceptable and can help the medical professionals in decision making for early diagnosis and to avoid biopsy. In the case of the above said data sets it is observed that the accuracy reached up to 100% when there is more number of attributes and the accuracy is decreasing as the number of attributes decreased. The medical term for liver cancer is Hepatocellular carcinoma. It is one of the most common malignancies in adults, and is more common for

men than women. The hepatocytes; however, the similarity varies with the degree of differentiation.

II.EXISTING METHODOLOGIES

Cancer research is one of the major research areas in the medical field. Accurate prediction of different tumor types has great value in providing better treatment and toxicity minimization on the patients. Different classification methods from statistical and machine learning area have been applied to cancer classification, but there are some issues that make it a nontrivial task. The gene expression data is very different from any of the data these methods had previously dealt with. First, it has very high dimensionality, usually contains thousands to tens of thousands of genes. Second, publicly available data size is very small, all below 100. Third, most genes are irrelevant to cancer distinction. It is obvious that those existing classification methods were not designed to handle this kind of data efficiently and effectively. Some researchers proposed to do gene selection prior to cancer classification. Performing gene selection helps to reduce data size thus improving the running time. In this existing system, we present a comprehensive overview of various cancer classification methods and evaluate them based on their computation time, classification accuracy and ability to reveal biologically meaningful gene information. We also introduce and evaluate various gene selection methods which we believe should be an integral preprocessing step for cancer classification. In order to obtain a full picture of cancer classification, we also discuss several issues related to cancer classification, including the biological significance vs. statistical significance of a cancer classifier, the asymmetrical classification errors for cancer classifiers, and the gene contamination problem.

2.1 GENE BASED DISEASE PREDICTION

Microarray technology has made the modern biological research by permitting the simultaneous study of genes comprising a large part of the genome. In response to the rapid development of DNA Micro array technology, classification methods and gene selection techniques are being computed for better use of classification algorithm in microarray gene expression data. Microarrays are capable of determining the expression levels of thousands of genes simultaneously. One important application of gene expression data is classification of samples into categories. In combination with classification methods, this tool can be useful to support clinical management decisions for individual patients, e.g. in oncology. Standard statistic methodologies in classification or prediction do not work well when the number of variables p (genes) far too exceeds the number of samples n which is the case in gene microarray expression data. The goal of our proposed project will be to use supervised learning to classify and predict diseases, based on the gene expressions collected from microarrays. Known sets of data will be used to train the machine learning protocols to categorize diseases according to their gene patterns. The outcome of this study will provide information regarding the efficiency of the machine learning techniques, in particular a KNN method. The efficiency of classification depends on the type of kernel function that is used. So here we will analyze the performance of various kernel functions used for classification purpose. Finally predict the diseases with severity levels and predict various types of diseases. Fig 2 shows proposed framework.
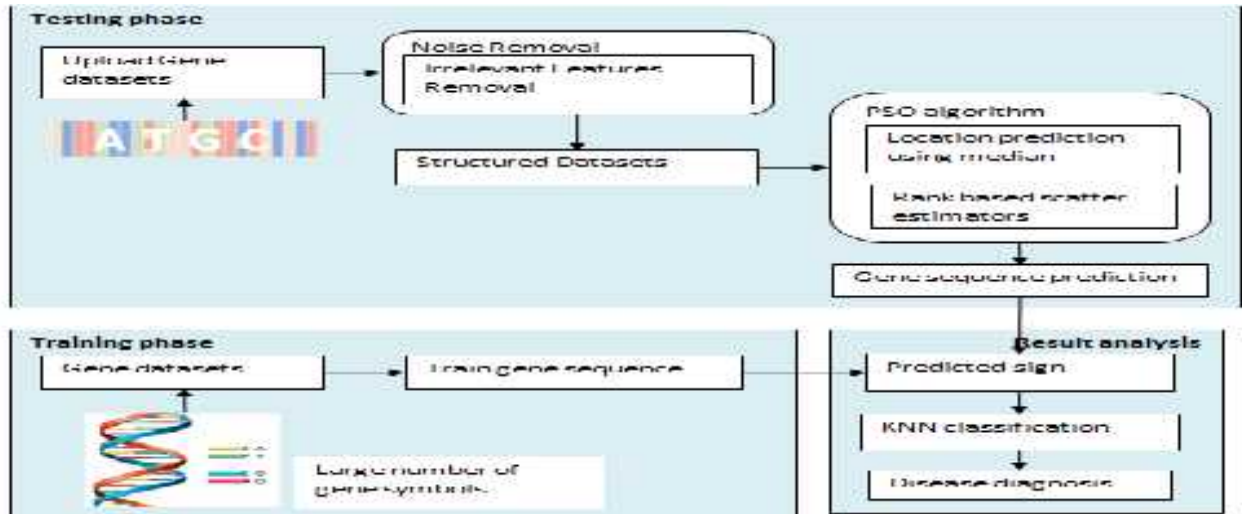
Fig 2: Proposed Framework

2.2 DATASETS ACQUISITION

In this module, upload the datasets. The dataset may be microarray dataset. A microarray database is a repository containing microarray gene expression data. Then implement preprocessing steps to eliminate the irrelevant symbols.

2.3 PSO ALGORITHM

In PSO algorithm, can analyze coverage of the data before clustering begins. And propose an algorithm, which modifies the nearest centroid sorting and the transfer algorithm, of the spatial medians clustering. It has two distinct phases: one of transferring an object from one cluster to another and the other of amalgamating the single member cluster with it's the nearest cluster. Given a starting partition, each possible transfer is tested in turn to see if it would improve the value of clustering criterion. When no further transfers can improve the criterion value, each possible amalgamation of the single member cluster and other clusters is tested.

2.4 DISEASE PREDICTION

Classifiers based on gene expression are generally probabilistic, that is they only predict that a certain percentage of the individuals that have a given expression profile will also have the phenotype, or outcome, of interest. Therefore, statistical validation is necessary before models can be employed, especially in clinical settings. In this module implement K nearest neighbor algorithm to classify the various types of diseases from gene expression. Classification is done with the help of KNN classifier. In the recent years, KNN classifiers have established excellent performance in a variety of pattern recognition troubles. The input space is planned into a high dimensional feature space. Then, the hyper plane that exploits the margin of separation between classes is constructed. The points that lie closest to the decision surface are called support vectors directly involves its location. When the classes are non-separable, the optimal hyper plane is the one that minimizes the probability of classification error. Initially input image is formulated in feature vectors. Then these feature vectors mapped with the help of kernel function in the feature space. And finally division is computed in the feature space to separate out the classes for training data. A global hyper plane is required by the KNN in order to divide both the program of examples in training set and avoid over fitting. This phenomenon of KNN is higher in comparison to other machine

learning techniques which are based on artificial intelligence. Here the important feature for the classification is the width of the vessels. With the help of KNN classifier we can easily separate out the vessels into arteries and veins. The KNNs demonstrate various attractive features such as good generalization ability compared to other classifiers. Indeed, there are relatively few free parameters to adjust and it is not required to find the architecture experimentally. The algorithm steps as follows:

for all the unknown samples UnSample(i)

for all the known samples Sample(j)

compute the distance between

Unsamples(i) and Sample(j)

end for

fing the k smallest distances

locate the corresponding samples

Sample(j1),….,Sample(jK)

assignUnSample(i) to the class which appears more frequently

end for

The performance of a KNN classifier is primarily determined by the choice of K as well as the distance metric applied. The estimate is affected by the sensitivity of the selection of the neighborhood size K, because the radius of the local region is determined by the distance of the Kth nearest neighbor to the query and different K yields different conditional class probabilities.

2.5 SEVERITY ANALYSIS

Using multi class classification algorithm to classify the severity level of diseases using classified data count. If count is more than threshold means, provide severity as high and count is less than threshold means, consider as normal. Then provide prescription to patients according to the diseases.

III.EXPERIMENTAL RESULTS

We can implement this system for uploading the gene datasets from NCBI Repository from this link https://www.ncbi.nlm.nih.gov/genbank/. And we can perform gene clustering and classification using ASP.NET (C#) as Front End and SQL SERVER as Back End for WINDOWS OS with any configuration.

KNN algorithm can be implemented and calculate the performance metrics for accuracy based on True positive rate, False positive rate, True negative rate and False negative rate.

Fig 3 Accuracy rate

Accuracy rate is calculated as

$$Accuracy = \frac{TP+TN}{TP+TN+FP+FN} *100$$

And compare the results with existing unsupervised, supervised algorithms. The proposed semi-supervised algorithm provide improved accuracy rate than the existing algorithms
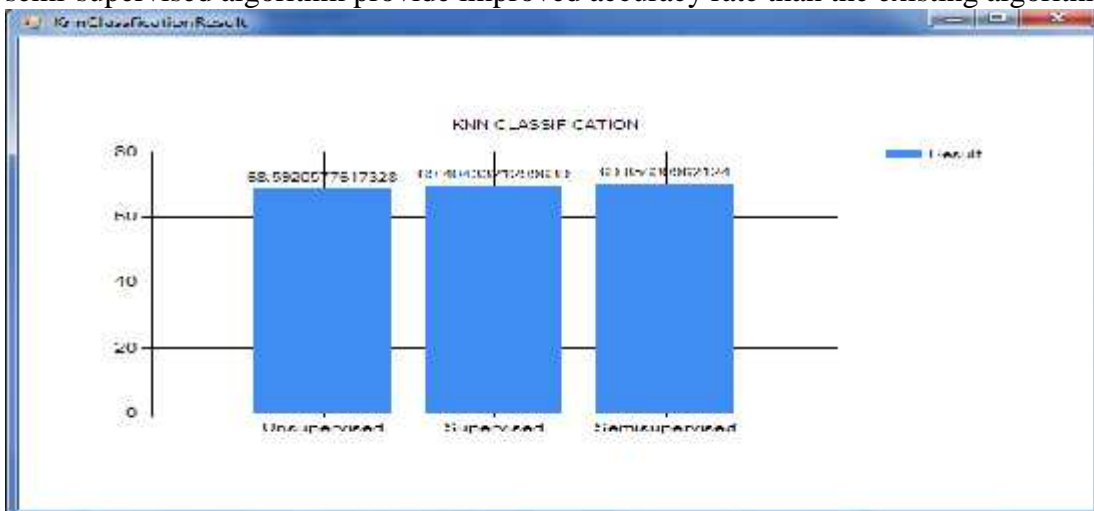

Fig 4 Performance Chart

The performance result is shown in fig 4and KNN algorithm provides 70% accuracy than the existing algorithms.

IV CONCLUSION

Microarray is an important tool for cancer classification at the molecular level. It monitors the expression levels of large number of genes in parallel. With large amount of expression data obtained through microarray experiments, suitable statistical and machine learning methods are needed to search for genes that are relevant to the identification of different types of disease tissues. In this thesis, we have proposed a hybrid gene selection method, which combines a PSO methods and KNN classification to achieve high classification performance. The method was designed to address the importance of gene ranking and selection prior to classification, which improves the prediction strength of the classifier. The project focused on promising accuracy results with very few number of gene subsets enabling the doctors to predict the type of cancer. The results on various disease datasets shows the importance of the same classifier used for both the gene selection and

classification can improve the strength of the model. Then provide severity level for each classified diseases. Future work includes partitioning of the original gene set into some distinct subsets or clusters so that the genes within a cluster are tightly coupled with strong association to the sample categories. We can extend the work to implement various classification algorithms to improve the accuracy rate at the time of disease prediction

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Informative Oriented Application For The Farmers

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Abstract-Web technology is increasingly being adopted in the agricultural space as a measure to assist farmers in their decision. The aim of this project is to enable farmers to have internet access to update information on pesticides and further make decisions on which pesticide to apply, how to apply them, when to apply them, and so on. Remote access to this system is provided through the internet. The information system provides the external users the ability to obtain summarized information in a preferred format. Security of the database is ensured by use of the password for updating the database. This will be helpful to the people who does higher studies on crops, research student, planters, importers and exporters which may fulfill the requirements.
Keywords : JAVA, SQL(Database), Netbeans, Apache Tomcat

I.INTRODUCTION

A web application or web app is a client server computer program which the client (including the user interface and client-side logic) runs in a web browser. By creating an web application it is easier for people to know and access information about the crops. This application emphasis the details about the crops and their usage by using the pesticide to avoid croploss.
Pesticides is a synthetic substance which is used to control pests and unwanted weeds. The objective of this work is to develop a Web application for various crop and pesticides used. To achieve these goals, we require an application to manipulate pest throughout numerous plants, which in turn would require use of chemical controls some instances. There has been a flow in the use of pesticides, fungicides, insecticides on crop damage and improve the productivity. But people using pesticides should know the information about the crops and pesticides they use. There has been a flow in the use of pesticides, fungicides, insecticides on crop damage and improve the productivity. But people using pesticides should know the information about the crops and pesticides they use. The proper dosage, timing, type of pesticide and season is very important to use the pesticide effectively without affecting the crop or environment.

II. LITERATURE REVIEW

Amrutha A, Lekha R, A Sreedevi, "Automatic Soil Nutrient Detection and Fertilizer Dispensary System". Concept involved in this project suggestspreparation of soil sample and the estimation of results from soil sample and then dispensing estimated amount of fertilizers to soil. The major advantage is that the process of addition of fertilizers thereby reducing the time and manuallabor required. The major disadvantage is that soil testing takes few days.

Austin Jones, Usman Ali, Magnus Egerstedt, "Optimal Pesticide Scheduling in Precision Agriculture". Concept involved in this project suggests scheduling for only Blue berry crops.

The benefit is that it evaluates the pest risks. The drawback is that it concentrates only on one crop.

G Sushanth and S Sujatha, "IOT Based Smart Agriculture System". Concept involved in this is that Photovoltaic cell to demonstrate how to watered crops without manual interuption with usage of GPRS, MicroController,Arduino kit. The major advantage is that it notify the farmer on the invasion of the field by animals. The limitation is that difficult to manage the sensor data and hardware facilities.

Richard K. Lomotey, Yiding Chai, Kazi A. Ahmed and Ralph Deters, "Web Services Mobile Application for Geographically Dispersed Crop Farmers".

Concept involved in this states three-tier architecture that consists of mobile devices, a cloud-hosted middleware, and cloud storage. Advantage is that it utilises the mobile technology. Disadvantage is that data will not be efficient for bndwidth management.

Ahalya C S, Kanchana V, Abin Krishna O, "Building up an information archive for putting away the pesticde data". Techniques involved in this suggests apriori algorithm to provide information for fertilizer. Advantage is that simplest one and it is easy to load the large batches of data into the star schema database. Disadvantage is that the execution time is more and computational cost is high.

III.PREVIOUS WORK

In previous application the work done is to develop a data warehouse for various crop and pesticides used. To achieve these goals, we require an application to manipulate pest throughout numerous plants, which in turn would require use of chemical controls someinstances. The use of pesticides in agriculture stays important to obtain ok manipulate of pests. Yet, there is an essential social weight towards the advancement of measures forlimiting the effect of pesticides on the earth and diminishingand controlling the dangers related with their application.The application provides the usage of the pesticides and the management of the crop fields and which does not gives the estimation of cost of the pesticides.The application gives a clear response tothe farmers about the amount of fertilizers and pesticides.The price of the fertilizers and pesticides will be clearly available.The endangered crops can be regained into the normal stage and that can be cultivated in large scale. Natural pest and disease control,crop insect pests,integrated pest management and plant protection management have been implemented in the application.

IV.PROPOSED MODEL

The web application which provides the estimation costs of fertilizers and pesticides with clear response. This helps the farmers to reduce the cost spent on the expenses of the fertilizers. The hazardous pesticides can be eliminated from the utilization of the fields. This protects the nutrients contained in the crops.

The aim of this project is to enable farmers to have internet access to update information on pesticide. In this application all the information's are stored in the backend using the MySQL which provide high security and privacy for the data's. The farmers shall receive notifications of the particular search pesticide.

The use of pesticides and insecticides in agriculture benefits in high yield, increased profits for farmers and reduction in diseases. When pesticides are used, they do not constantly stay in the place wherein they are implemented. The agriculture information varies due to it

geological factors such as environment, soil, methods used in cultivation and harvest etc. Due to this diversity the information is stored based on different dimensions in time – calendar year,
agricultural year and financial year. With the increasing volume of information and new pesticides coming to market a common repository is required where the local farmers can use the pesticide efficiently without any operating hurdles

V.SYSTEM ARCHITECTURE

The system architecture shows how the farmers get the information about the particular pesticide and their uses
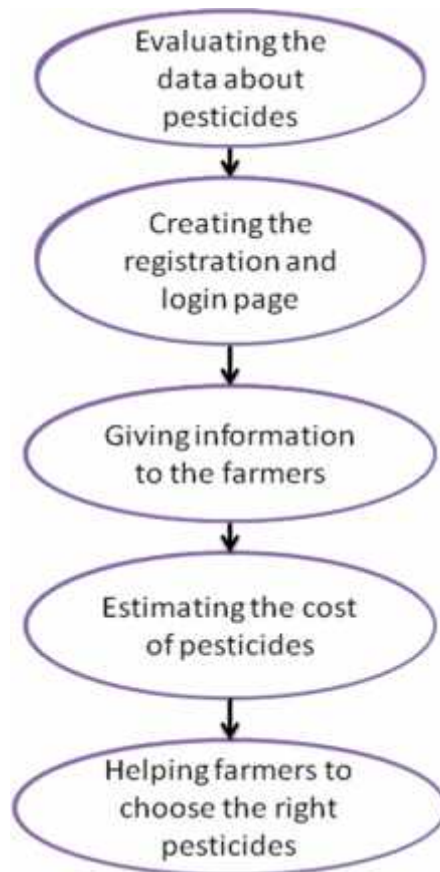

Fig: System architecture for the crop protection

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VI.GENERAL APPROACH

The main aim of the project is to provide the farmers to login or sign into the account to know about the pesticides and their usage. It also notify the messages to the farmers about the searched crop and what type of pesticides they want to use to avoid croploss. It updates about the climatic changes, analyze the temperature etc. This application also provides the variety of cereals, pulses, forage crops, millets and so on.
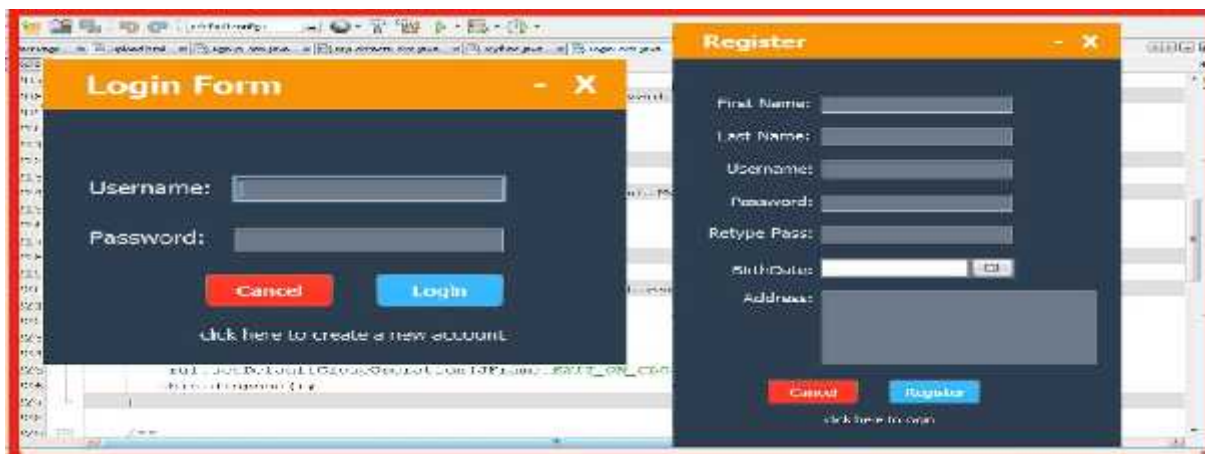
The below pie chart shows the percentage of worldwide consumption of pesticides.
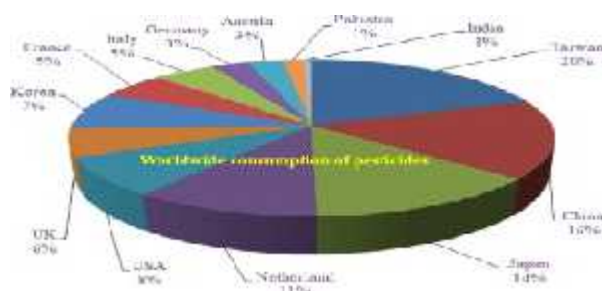
VII.STIMULATED RESULTS

The stimulated results shows the way for easy communication between the systems using the unique registration id. This also provide the farmers to easily register into the web application.

The admin login is used for the administrators who maintains the application data and monitor the anonymous users who search the pesticides without registering the websites.

Some of the common types of pesticides which will help the farmers to kill weeds, to kill insects, to kill moulds and to kill bacteria . Insecticides that provides bug sprays, insect repellants, garden dusts. Herbicides which provides the weed killers. Fungicides that suggests rose and flower sprays. Wood preservatives that would preserve the pressure-treated wood.

Common Types of Pesticides

Category	Purpose	Examples
Insecticides	Kills or repel insects, ticks and mites	• bug sprays • insect repellents • ant and roach baits • garden dusts or sprays • commercial farm/orchard sprays • flea shampoos, flea and tick collars • moth balls
Herbicides	Kills weeds or unwanted plants	• weed killers • weed and feed lawn care products • tree cut/stump treatments
Fungicides	Kills mould, mildew and other fungi.	• rose and flower sprays • commercial farm/orchard sprays • treated seeds • paint additives
Rodenticides	Kills rodents such as mice and rats.	• mouse and rat bait stations
Disinfectants	Kills bacteria, mould and mildew	• bleach • ammonia • kitchen and bathroom cleaners • pool and spa cleaners
Wood preservatives	Protects wood from insects and fungi.	• pressure-treated wood

Some of the banned pesticides are as follows;

Sl. No.	Name of pesticides	Sl. No.	Name of pesticides
1	Aldrin	15	Pentachlorophenol
2	Benzene Hexachloride	16	Phenyl Mercury Acetate
3	Calcium Cyanide	17	Sodium Methane Arsenate
4	Chlordane	18	Tetradifon
5	Copper Acetoarsenite	19	Toxafen
6	Dibromochloropropane	20	Aldicarb
7	Endrin	21	Chlorbenzilate
8	Ethyl Mercury Chloride	22	Dieldrine
9	Ethyl Parathion	23	Maleic Hydrazide
10	Heptachlor	24	Ethylene Dibromide
11	Menazone	25	TCA (Trichloro acetic acid)
12	Nitrofen	26	Metoxuron
13	Paraquat Dimethyl Sulphate	27	Chlorofenvinphos
14	Pentachloro Nitrobenzene	28	Lindane*

* Banned vide Gazette Notification No. S.O. 577(E) Dated 20/03/2011-Banned for Manufacture Import and Formulate w.e.F 25th March,2011 and banned for use w.e.f. 25th March,2011.

VIII. CONCLUSION AND FUTURE WORK

This application is very efficient and helpful for the farmers who want to know about the pesticides and their uses.This also notify the messages to the farmers about the particular pesticides used for the crop. By this the endangered crops can be regained for normal stage and friend by their location.Thusthis provide very efficient and accurate results to the users. It is can be implemented in large scale.This provide a unique facility for the application. The use MySQL and GCM provide a good backups of the data and fast message transfer.In this we are working for the statistics of the crops but in future we would bring it for the additional features such as climate, temperature and so on.

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Analysis and Importance of Software Development

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Abstract - Software project management is an art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled. In software engineering, a software development process is the process of dividing software development work into distinct phases to improve design, product management, and project management. It is also known as a software development life cycle. A software process is represented as a set of work phases that is applied to design and build a software product. Project management objectives are the successful development of the project's procedures of initiation, planning, execution, regulation and closure as well as the guidance of the project team's operations towards achieving all the agreed upon goals within the set scope, time, quality and budget standards.In this paper the effective trends and ways for the software development life cycle has been represented.
Keywords- integration, requirement, project Management, software process, test, integration, Requirement.

I. INTRODUCTION

The software engineering can be defined as a set of tools ,method and techniques which are applied to develop a professional software. The software project management objective is produce quality software products to satisfy user needs Scheduled times and at acceptable cost. Project management software is software used for project planning, scheduling, resource allocation and change management. It allows project managers (PMS), stakeholders and users to control costs and manage budgeting, quality management and documentation and also may be used as an administration system. Especially for small Sized companies, many software project teams are unable to Deliver quality products on time. The key to achieve this Objective is to introduce a suitable software process. There are many famous existing processes in the world, Such as RUP (Rational Unified Process), TSP (Team Software Process), PSP (Personal Software Process) etc. They all have many successful cases. But it is very hard to use Those processes in small sized companies in our nation. Because the small size companies have not enough money, People, or other resources to apply them directly. After we Study the problems which often appear in some small sized Companies, we present a process framework. This framework Will be helpful to other small sized software companies.

1.1 IMPORTANCE OF SOFTWARE PROJECT

The software project is considered to be a very sensitive one because of the following reasons

- It's greater flexibility
- High level of analogy
- Limited and short period
- High knowledgeable engineering personnel needed
- Focused point of attention needed
- High probability of crash
- Higher demand
- High cost

II. THE PROBLEMS OF SOFTWARE PROJECT IN SMALL SIZED COMPANIES

The generally organized in the form of project teams in Small sized companies. Each company has several project teams, Each team has response to a software project, some of them have an individual testing team Most companies do not have a defined software process, the Success of project depends on hard work of kernel members of a team. There are many problems in the development of Software projects, key elements are:

1. Unable to distinguish the kernel requirement and important requirement from others.
2. The new requirement appears continuously after the project starts, leading to endless projects.
3. User requirement changes in the development.
4. Hard to control the defects in the program unit while Coding.
5. Hard to integrate the program unit developed by Programmers individually.

Those problems cause time delay, increasing cost, decreased users' satisfaction. After analyzing those problems, we present a simple software process framework. This framework defines the roles, activities and products to convent the software development process.

III. GENERIC SOFTWARE PROCESS FRAMEWORK

The framework emphasizes the basic activities in the development process and the basic responsibilities of team Members. The development process of a product is divided into three cycles with incremental models, each cycle finishes part of a final product and builds a new software version. The time of cycle depends on the work of each cycle, the suitable time is 1 to 3 months. The final product is finished after all cycles completed.

The framework defines four roles: project manager, system analyzer, programmer and tester. Fig.1 describes the structure of the project team. In the actual team, each role can be fulfilled by one or more persons and each person can also act to more than one role.
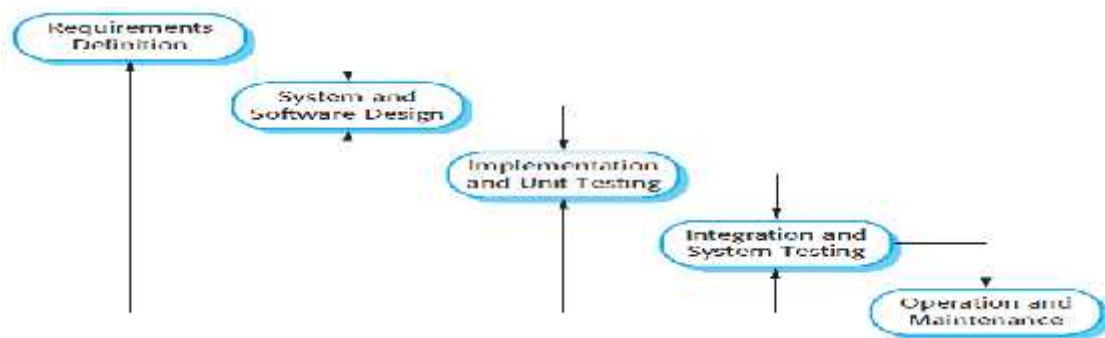

Figure 1: Generic software Engineering process

IV.PHASES OF SOFTWARE DEVELOPMENT LIFE CYCLE:

4.1 REQUIREMENT ANALYSIS:

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, calledrequirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications.Basic six steps in requirements analysis is given below.Develope the requirements,write and document the requirements,check completeness,Analize   refine and decompose requirements,validate ,Manage requirements. The results of the requirements elicitation and the analysis activities are documented in the Requirements Analysis Document (RAD). This document completely describes the system in terms of functional and nonfunctionalrequirements and serves as a contractual basis between the customer and the developer. Main activities involved in requirements are given below.

- Identify customer's needs.
- Evaluate system for feasibility.
- Perform economic and technical analysis.
- Allocate functions to system elements.
- Establish schedule and constraints.
- Create system definitions.

4.2 DESIGN:

The system design is divided into various module for doing the module with focused concentrate to avoid the probability of rising bugs.two types of designs is done here

- High level design(HLD)
- Low level design(LLD)

How the modules are going to interact with each other is defined in HLD.In LLD the the algorithms ,flow charts,class diagram,sequence diagram,and ER model are created.

4.3 BUILD:

In building the software is build by the team of engineers .the Unit testing is done in this phase itself.it is the preliminary verification of the software that is Built.the software doesn't going to handover to the testing team without completing this phase.it is also called as peer review in this review the testing is done on

- Efficient logic
- Coding standard
- No dead code
- Un used variables
- Code average

4.4 TESTING:

The testing is done by testing engineers under the control of the Quality Expert. The main theme of testing should be for cross checking whether the system has satisfied the requirement of the user or the client, the most to find the bug only.

Types of testing

White box testing

It is done to verify the control flow and data flow checking of the software.it is done by the people who has higher experience in that field and greater knowledge about the software programming.the inner loops ,functionalities are being checked here.

Black box testing

This is done for testing the behavior of the software like security, reliability, accuracy and more behavioral properties. It is done by the end user or any external client.

The system is integrated for overall testing.

Today's trends in software testing:

- Increasing adoption of DEVOPS-set of practices that aims to reduce the time from development to operation.
- Combining manual and automated testing-both manual and automated testing can be done for accurately find the bugs as well as requirement missing.shortening deliveries and complex test.
- Increasing mobile test automation
- API and service test automation
- Big data testing-testing data sets high demand on analytical tools tehniques and frameworks.
- Internet of things testing

4.5 OPERATION AND MAINTANANCE:

If there is any bugs in the sotware after the release of the software it is again collected from the user for the next version of the project.

Main roles in a software projct

- The project manager
- The architect
- The business analyst
- The quality expert
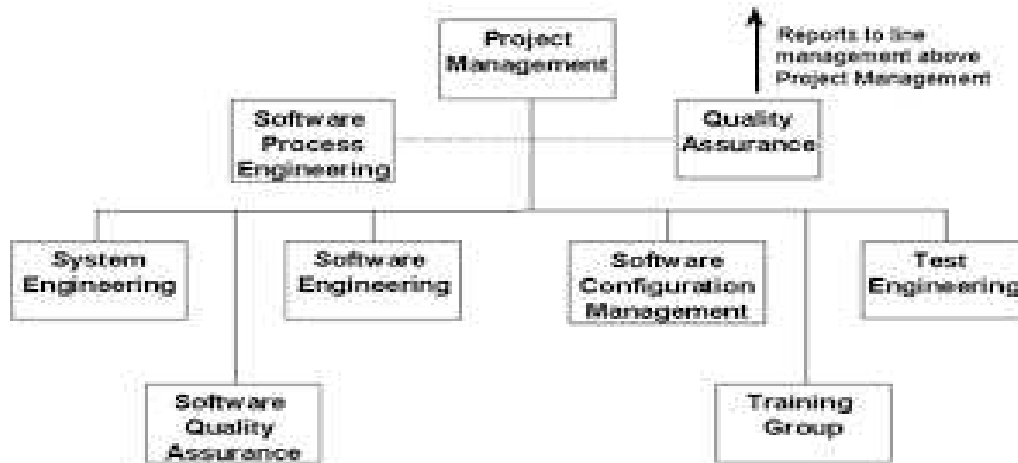- Module lead
- Testing team
- Programming engineers

Figure.2:Software Process Personnel Roles

V.IMPORTANCE OF A SOFTWARE ENGINEER

Software engineering is important because specific software is needed in almost every industry, in every business, and for every function. It becomes moreimportant as time goes on – if something breaks within your application portfolio, a quick, efficient, and effective fix needs to happen as soon as possible. The importance of software development services. Software development isan umbrella term used to refer to the overall process that involves several tasks, such as computer programming, documenting, repairing and testing that concern both the creation and the maintenance of applications and frameworks.

The top advantages of software developer jobs.
- The rate of pay is very good.
- The skills are transferable.
- Work anywhere.
- Comfortable working environment.
- Constant learning curve.
- You can be as creative as you want.

Modern processes use software versioning. Software engineering management: the application of management activities—planning, coordinating, measuring, monitoring, controlling, and reporting—to ensure that the development and maintenance of software is systematic, disciplined, and quantified. Computer software engineers typically work in well-lit offices in comfortable surroundings or in computer laboratories. Most work at least 40 hours a week, but due to the project-oriented nature of the work, they may also have to work evenings and weekends to meet deadlines or solve unexpected technical problems.the software developer has

- High responsibility of bringing the software
- Involves in coding and all the development phases of sdlc
- Involving in 4d that is design ,develop, deploy, discover.
- Analize and modifies current system to work efficiently
- Making sure of meeting all the user requirements
- Prepare test cases,plan,training manuals
- Maintain the system after delivering the product

VI. CONCLUSION:

Modern processes use software versioning. Software engineering management: the application of management activities—planning, coordinating, measuring, monitoring, controlling, and reporting—to ensure that the development and maintenance of software is systematic, disciplined, and quantified. Software engineering applies the knowledge and theoretical understanding gained through computer science to building high-quality software products. Professionals looking for a skill development mechanism so they can enter the practice or improve their current abilities would benefit from the program. General purpose application software is a type of application that can be used for a variety of tasks. It is not limited to one particular function. For example a word processor could be classed as general of emerging purpose software as it would allow a user to write a novel, create a restaurant menu or even make a poster. So this paper reveal the importance of a software engineer who plays a vital role in software development field.

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